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Principal Contents

ILLUSTRATIONS

PAGE

520 Remodelled Vauxhall Station, Yarmouth. By H. H. Powell
525 Municipal Museum of Science and Engineering. By George Kenyon
529 Police Station, Clerkenwell. By J. Innes Elliott

ARTICLES

522 Building in Twenty Years' Time: Junior Liaison Committee Conference Report
528 More Everyday Things—60. By Arthur W. Kenyon, CBE
537 Flats at Barking: Rapid Precast Concrete Construction
538 Sheffield Redevelopment: Proposals for the Sheaf Valley
538 Profiteering in Land: Trades Union Congress Resolution
539 Town Planning and Land Scarcity: Some Reasons for Inflated Prices
542 Firm Prices in the Common Market: Manufacturers' Present Attitude Criticised
543 Heating, Ventilating and Air Conditioning: Exhibition at Olympia
544 Co-ordination by Design-Modules: BRS Paper by J. W. Harding
556 Day-Releases in Scotland: Consultative Committee on 'Disappointing Results'

Leading Articles

'The Last Adventure'

THOSE WHO REGARD the future for the industry of building with pessimism did well to keep away from Cambridge last week-end, else they could well have lost their status. The occasion was a conference organised by the Junior Liaison Committee of Architects, Quantity Surveyors and Builders to discuss the provocative subject of 'Building in Twenty Years' Time,' and the quality of the young professionals who came from many parts of the country and the lively nature of their discussions and findings, cheering in the extreme, fully justified the enthusiastic preparatory work of the committee and its chairman and hon. secretary, MR. MICHAEL SIMPSON and MR. JEREMY MACKAY-LEWIS.

The conference followed the pattern of preliminary talks by senior experts, followed by discussion groups, the groups' reports and summing up by the chairman, MR. E. D. JEFFERISS MATHEWS. The problem facing the industry in 1980 was posed in startling fashion by an economist, MR. JOHN WOOD, who traced economic and population trends which show that the building industry may well be called on in twenty years time to carry out an annual programme of nearly £3,000 millions (a two-thirds increase on the 1960 programme) with a labour force of about 1,650,000 men (roughly only 100,000 more than present numbers). To achieve this production, productivity must rise from a present output of £1,108 per man to £1,746 in 1980, approximately a 60 per cent improvement.

Assuming that the figures are valid, can this spectacular improvement be reached? The Conference was in no doubt that it could be, and was inclined to endorse the majority of the ways and means outlined by MR. DONALD GIBSON, while adding some of its own. Mr. Gibson (who like other speakers was doubtful whether Mr. Wood's estimate of the 1980 programme was sufficiently high) listed the weapons available in the industry's armoury, among them being much greater use of prefabrication and of such systems as CLASP; more efficient professional services through consortia of architects and consultants; more cost planning; reduction of drawing-office work through standard details; establishment of an accepted module (which would assist manufacturers) and acceptance of the metric system (all-important when Great Britain enters the Common Market); a national code of by-laws; greater use of serial planning and negotiated tenders; change of emphasis in architectural education in the direction of programming and drawings as a means of conveying information to the builder; the use of more mechanical plant by builders; and withdrawal by the architects' professional bodies of the ban on architects joining contracting firms as directors.

To this list, the conference added others, notably the need for some form of joint education; concentration on fewer and fully tested materials and components rather than more and untried; more readily available results of research and better distribution of technical information; the setting up of a standing organisation which should keep the Government aware of trends; improvement of the operative's status and wages which at present are too low to encourage prefabrication, and shortening of the time taken in apprenticeship; and the introduction of shortened bills of quantities which could facilitate the contractor's programming (here endorsing a suggestion made by another principal speaker, MR. P. W. GRAFTON). Somewhat strangely, no one made reference to a major method of increasing production—re-forming the craft unions to reduce demarcation troubles, and so assisting to

get rid of restrictive practices. Without the active co-operation of the operatives, no drive for greater productivity can fully succeed.

Gallant and successful efforts were made by the discussion groups to project themselves twenty years ahead; and it was only to be expected that the present time kept thrusting itself into the picture. The conference was made aware of one facet by MR. HECTOR MCDONALD'S group which reminded the members that there was a pressing need to tidy up their own professional houses so as to be in better position to re-organise for the future. And another salutary reminder came from MR. DAVID WOODBINE PARISH who brought into the very centre of the picture the cardinal requirement of all industry today—men with knowledge and leadership, capable of bringing the qualities of integrity, courage and clear thinking to the building tasks. Mr. Parish is, of course, right. It is men of this calibre who will shape the future, and the industry's present main task is to bring in many more such men, and to train them for rewarding posts in what one speaker finely described as 'the only adventure that is left'—the adventure of building.

Scottish Building Standards

THE SCOTTISH DRAFT BUILDING STANDARDS* represent a further step towards a code of building regulations which is efficient without being restrictive on development. The history, over the last 30 years, of by-law revision in this country recounts the advance of building technology from purely empirical practice to more rational techniques. Starting with the Model By-laws of 1937, continuing through the work on Codes of Practice to the 1952 Model By-laws, the 1954 Scottish By-laws and subsequent Scottish legislation, these developments have provided the most valuable of all opportunities for the interchange of views between representatives of industry and professional practice, of building research and development and of local authority administration.

An important part of building research over the last 40 years has been directed towards the objective assessment of the performance of building elements by measurements capable of expression in numerical form. Where the results of this work could be readily assimilated into British Standards, little difficulty was experienced in securing appropriate reference in revised by-laws but these cases covered little more than materials as such and small manufactured units. The work for the 1937 Model By-laws indicated the need for generally accepted codes of building practice as a basis for further developments in the freeing of building regulations from the stranglehold of established practice and, in spite of the war, valuable progress was made in the compilation of these codes during the following decade.

Unfortunately, the trend from highly specific towards more flexible by-laws brings increasing difficulties in administration and, since the war, work on revision of building regulations has been concerned at least as much with problems of interpretation and application as with the nature of technical requirements. In the 1952 Model By-laws, requirements were, wherever possible, drafted in a functional form, that is they defined technical objectives rather than constructional methods. In order to assist administration, however, the by-laws also included descriptions of constructions which could be 'deemed to satisfy' the functional requirements. These 'deemed to satisfy' clauses were printed in italics and gave a duality to the whole document which was not altogether satisfactory. The new Scottish Draft avoids this disadvantage by setting out acceptable specifications in an appendix.

The general form of the Scottish Draft, besides being more consistent than that of Model By-laws Series IV Buildings, has also much wider scope. Part I, a general introductory section, and Part II, Materials and Durability, follow familiar lines. Then come Part III, Structural Strength and Stability; Part IV, Structural Fire Precautions; and Part V, Means of Escape from Fire. The first two of these have much in common with corresponding sections in Model By-laws, although the arrangement is more logical in the Scottish Draft and the technical requirements are more fully defined there. The Means of Escape section is a new one and clearly owes something to the earlier LCC Code of Practice. The requirements set out in the Scottish Draft, however, take account of more factors and are, in consequence, more detailed. Part VI deals with chimneys, flues and hearths not very differently from Model By-laws but it includes, also, a section on the installation of heat-producing appliances which is new and which recent developments have rendered necessary.

Part VII, Preparation of Sites and Resistance to the Passage of Moisture, is a collection of clauses having broadly similar functional purpose which, in earlier documents, were distributed among sections dealing with various parts of the building, foundations, walls and so on. Part VIII, Resistance to the Transmission of Sound, is new and includes, in an appendix, performance requirements for separating walls and floors when tested in accordance with the relevant British Standard. The table of specifications contains a selection of wall and floor constructions deemed to satisfy sound insulation requirements, and one judges that these will play the major part in the application of this section in the immediate future.

Part IX, Resistance to Transmission of Heat, was the subject of experiment in the 1952 Model By-laws and requirements based on thermal transmittance coefficients are now quite familiar. Rates of fresh air supply for mechanical ventilation are a new feature of Part X, Ventilation, which goes a long way beyond the ventilation clauses formerly included in the Space about Buildings section. In the Scottish Draft, the function of space about buildings is clearly for daylighting purposes, this function being the subject of Part XI. Requirements generally are based on daylight factors, standards of minimum values for various rooms being given as an appendix. Part XII, Drainage and Sanitary Appliances, has much in common with Model By-laws but Part XIII, Electrical Installations, is new, the clauses following normal requirements for systems and apparatus. Of the remainder of the document, Part XV, Housing Standards, must be mentioned, since it has not previously been the custom to include a formal statement of the amenities required in dwellings.

The Public Health Act, 1961, empowers the Minister to issue corresponding regulations for England and Wales. These will replace Model By-laws and the form will presumably follow the Scottish prototype. Representations on the Scottish draft must be made before December 1 next, and great interest will attach to the reactions of local authorities and others concerned with the administration of the regulations. Future policy in England is likely to be influenced by the reception given to this Draft, the general pattern of which represents the most rational approach to building construction that has yet been achieved.

* Publication reported in 'The Builder,' August 4, 1961, p. 212.

Notes of the Week

Spreading the Architectural Load ; Progress in South London ; A Journal's 75th Anniversary

IN A RECENT ISSUE of the 'Daily Telegraph,' 'Peterborough' the diarist drew attention to the many public appointments held by Sir William Holford, a list which includes the Presidency of the RIBA, membership of the Royal Fine Art Commission, the Historic Buildings Council, and a place on the Minister of Transport's advisory group on urban traffic. 'His large private practice includes advisory work on St. Paul's precincts, Piccadilly Circus and Oxford's roads,' the article continues. 'Much of his work lies in Commonwealth countries to which he travels frequently. One may wonder,' concludes the writer, 'why so much has to fall on one man in an enormous profession—and whether it augurs well for the profession.'

* * *

'PETERBOROUGH' here is being a little unrealistic. The penalty (if that be the right word) of skill and success in architecture and planning as well as in other directions is that commissions flow in unsought, and it must be extremely difficult to control the intake. Holford just recently refused an invitation to design a housing layout at Dorchester-on-Thames, though this was on grounds connected with planning aesthetics. But he cannot be alone among architects in the public eye in wondering, as he must sometimes do, how to preserve an even flow of work. Some of his brother professors—Robert Matthew and Llewelyn Davies among them—must be similarly perplexed, for between them they must have several million pounds worth of commissions on hand. In fact, they make nonsense of Shaw's dictum that 'Those who can, do ; those who can't, teach.'

* * *

NEVERTHELESS, the concentration of very large volumes of work in a comparatively few offices (there are, of course, others apart from those listed) must make one ponder, in 'Peterborough's' words, 'whether it augurs well for the profession.' This is something about which more should be known when the RIBA survey of architects' offices is made public. Not that such large offices have it all their own way: the statistics published last week by the RIBA show that the decline in commissions in the second quarter has hit the large more heavily than the small office.

What must give rise to some wonder is how teachers with very large private practices make time to discharge their professional duties. That the students must gain through direction of their studies by practical men is undoubtedly true, and one hopes that this trend will continue. But when, as recently happened, a student at one of the university schools was heard to say that he had been in the school a full year but had never laid eyes on his Professor, the question is prompted whether a division of energies is always achieved.

Progress in South London

ON VIEW at the South London Art Gallery until September 30 is an exhibition in which may be seen a panoramic picture of the post-war changes that are taking place in the inner south London boroughs. The 'New Patterns for Old Boroughs' exhibition, arranged by Camberwell Borough Council, consists of architects' models, photographs and drawings lent by the LCC, the various borough councils in the area and from other public and private sources. Aside from the purely technical interest this collection of development and redevelopment plans, some of which are already reality, does show the harassed London public that there are plans behind the present apparent confusion. The more well-known schemes for this densely populated hinterland—the Elephant and Castle and South Bank plans, for example —are shown, but by far the most interesting are the numerous housing projects, from tall blocks to garden estates, that have grown almost unnoticed during the past fifteen years. Interesting, too, are the schools, including Chamberlin, Powell and Bon's newly-completed Trinity School in Southwark, of which a fine model is on view.

* * *

TO EMPHASISE that south London is indeed changing its identity there are some large photographs and pictures from old records which show the newly-developed areas as they were—the scenes of frightening cheek-by-jowl slum conditions. The area round the Elephant and Castle, of course, was partially cleared by Hitler's Luftwaffe, but there is still a great deal to be done.

A Journal's 75th Anniversary

CONGRATULATIONS to our contemporary 'The Board of Trade Journal' on its 75th anniversary of useful life. It was founded on September 15, 1886, the day on which (as Mr. James Holroyd, the present editor, reminds us in an entertaining editorial) a bridge over the river Lagan in Belfast collapsed and Ormonde (Fred Archer up) won the St. Leger for the Duke of Westminster.

Shortened in title but extended in scope, the 'Board of Trade Journal' in a recently improved format continues to gives industrialists in general and exporters in particular the kind of information and data on which they must depend for accurate assessment of markets.

Poet's Corner

AT A CONFERENCE organised last week-end by the Junior Liaison Committee of Architects, Quantity Surveyors and Builders (JLC), at Downing College, Cambridge, Mr. John Wood, the economist, stated that by 1980 the capital investment in building would have risen from the present figure of £2,000m. annually to £3,000m.

Some of our doleful pundits speak
Of 'being near or past the peak
Of post-war building'; say not so
With miles of filthy slums to go,
New Towns to build, and by the score
Others to rebuild and restore.
The JLC and others should
Have confidence in Mr. Wood;
Such thoughts with pessimism reek!
So far from being near the peak,
If we're to realise our hopes
We're only on the lower slopes!

ANON

ARTHRITIC CENTRE IN SUSSEX.—*Work is to commence shortly on the Horder Centres for Arthritics' first residential centre at Crowborough, Sussex. The buildings will avoid an institutional atmosphere. The scheme includes facilities for physio- and hydro-therapy treatment, a sick bay, kitchen, dining room and an administration building. The architects are J. A. Crabtree and Associates of London, and the associate in charge H. E. Senkowsky*

Remodelled Vauxhall Station, Yarmouth

H. H. POWELL, MBE, B ARCH, FRIBA, architect, eastern region, under the direction of
A. K. TERRIS, BSC, MICE, chief civil engineer
R. G. CARTER, LTD., general contractors

main entrance to the booking hall

EASTERN REGION have remodelled the 117-year-old Vauxhall station at Yarmouth. Reconstruction began towards the end of 1958, and the first stage included the provision of an enlarged covered passenger concourse, temporary left luggage and waiting room facilities, the lengthening of two of the platforms and certain improvements to assist train operation in the area. This part of the scheme was completed by the summer of 1959. The second stage comprises the construction of the new station buildings. These consist, on the east side, of ticket, parcels and inquiry offices, parcels loading dock, bookstall, ladies waiting room, toilets, left luggage office and accommodation for station and train staff. On the west side, bordering the main concourse is another block accommodating the police and stationmaster's offices, male toilets and general waiting room.

The new main entrance is on the east side of the station and two additional entrances to the concourse are provided for use during the summer peak period. A movable barrier shuts off part of the concourse area during the quiet winter months. High level glazing on the east and west sides of the concourse and what amounts to a wall of glass on the south aspect, take full advantage of natural light.

All the windows in the station have white frames and black opening lights. The extensive use of glass and natural timber used in the construction is intended to give a nautical appearance to this seaside station. The canopy over the main station entrance is large enough to protect passengers arriving by cars in the rain.

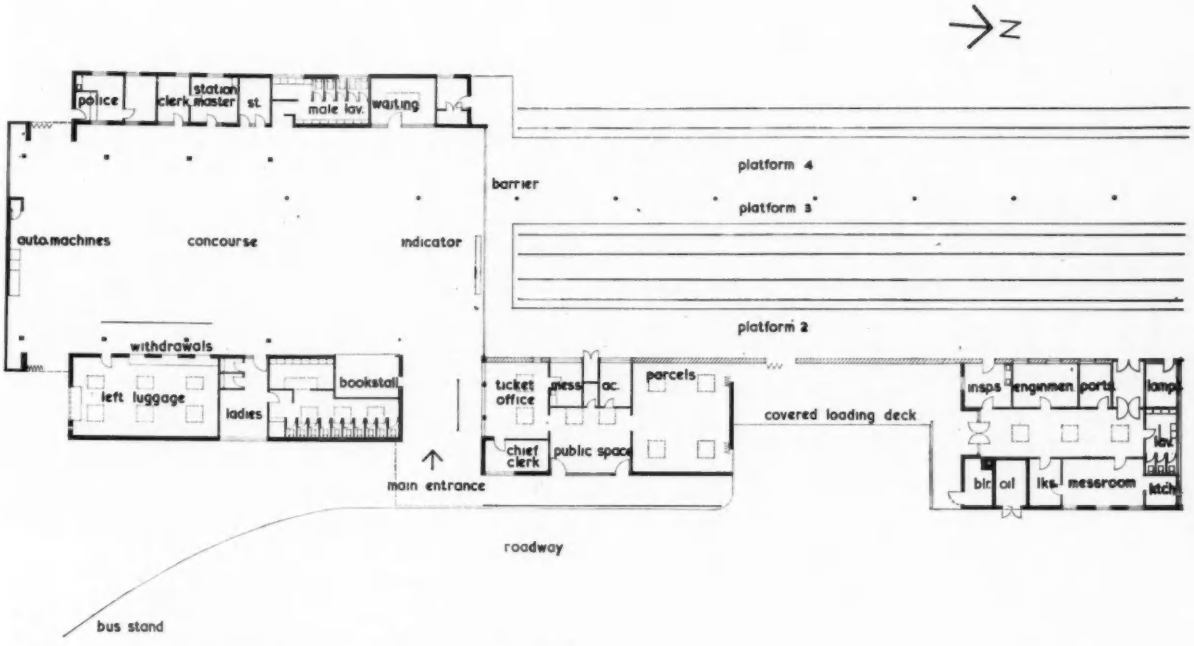
All surfaces and fittings have been chosen for good appearance, durability and easy maintenance.

The ticket office has linoleum floor tiles, white emulsion-painted walls, mustard-coloured ceiling and olive doors. The walls of the general waiting room are covered in Italian glass mosaic and here, as in the ladies room, the furniture has been specially designed for British Railways. Seats are of hardwood slats in Makore, finished in a hard, heat and scratch-resisting lacquer. The frames of the furniture are of rigid steel, rust-proofed and stove enamelled. Heating is by underfloor coils fed by oil-fired boilers.

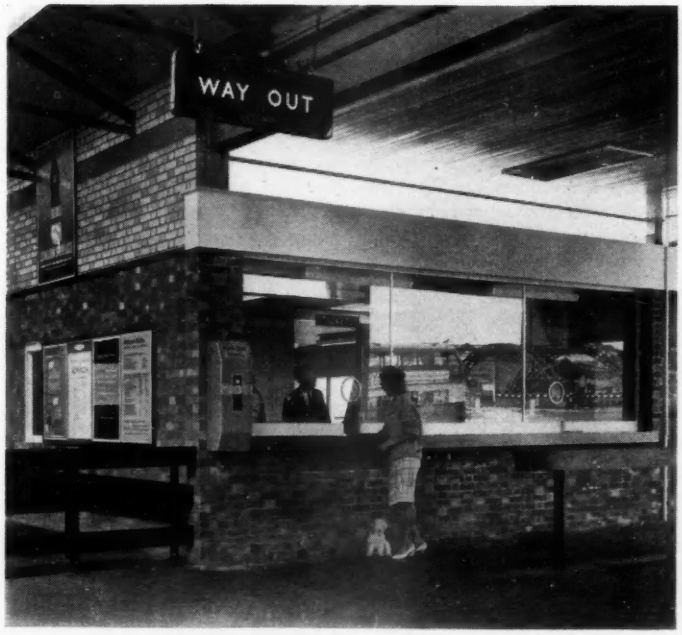
The ticket office has a Flexiprinter machine which issues both ordinary and season tickets at a rate of 100 per min.

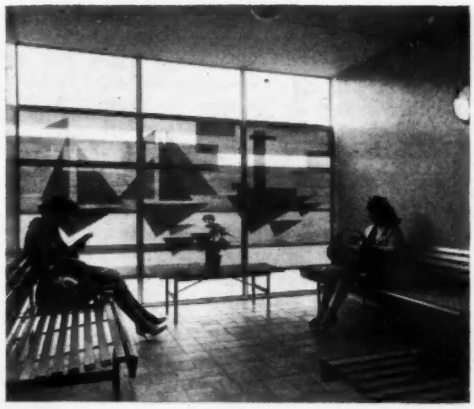
sub-contractors & suppliers:

Roof of station buildings: 'Cawood' Lightweight roof by Cawood Wharton Ltd.; *shutters and gates:* Bolton Gate Co. Ltd.; *patent glazing:* Hopes & Sons Ltd.; *Panalite underfloor heating:* Benham & Sons Ltd.; *steelwork:* Robert Stephenson Ltd.; *ticket office furniture:* Norwood Steel Equipment Co.; *bricks:* Proctor Lavender; *concourse spacedeck roof:* Dennings of Chard; *decorative screen:* Plyglass Ltd., designed by Angela Bond, AA Dipl., ARIBA; *messroom furniture:* Cox & Co. Ltd.; *station name:* J. Akers Ltd.; *plastic station signs:* Drakard & Humble Ltd.; *brasswork:* Halls of Norwich; *w.c. partitions:* Warecrete Ltd.; *ticket office desks:* Roneo Ltd.; *I.R.M.A. glass mosaics:* P. Barwin Ltd.; *waiting room furniture:* S. Hille & Co. Ltd.; *electrical and telephone installation:* Chief Signal & Telecommunications Engineer, Eastern Region.



PLAN AT CONCOURSE AND PLATFORM LEVEL, Scale: 1 in = 40 ft





Left, ticket office at the entrance to main concourse. Finishes and materials were chosen to combine good appearance with durability and easy maintenance. Above, the ladies waiting room, which has glass mosaic wall finish and coloured plyglass windows

'Building in Twenty Years' Time'

Notable JLC Conference at Cambridge

A notable conference on the subject of 'Building in Twenty Years' Time' was organised for last week-end at Downing College, Cambridge, by the Junior Liaison Committee of Architects, Quantity Surveyors and Builders. Over 90 people attended from many parts of England and Wales and the Conference (which generated much enthusiasm and produced many ideas) was admirably chaired by Mr. E. D. Jefferiss Mathews. Principal speakers were Mr. John Wood, an economist (head of Economic Section, AEI), Mr. D. E. E. Gibson (Director-General of Works, War Office), Mr. P. W. Grafton, quantity surveyor, and Mr. David Woodbine Parish, builder.

Chairman's Introduction

IN OPENING the conference MR. JEFFERISS MATHEWS said that one of the biggest dangers of any generation was to assume that the state of affairs they knew would be the same for the next generation. There was no precedent for this through history. It was not beyond the wit of man to study the present and from it to make reasonably accurate assumptions of the future, and a worthwhile contribution could be made by the generation which, from its own and past experiences, from a sound knowledge of present faults and ills, could plan ahead with proper vision based on research and study of the likely evolution and trend of things in the years immediately ahead.

'To probe this question must be the whole theme of this conference. It would be wrong if we concern ourselves only with talk about how to make the industry better, technically or administratively, or how to achieve better architecture within the present scene. The way we can all get real value—and make some long-term contribution to progress—is to treat this week-end as a research into the future. There is one overall dominating factor that will control the scene: none of us can make our respective contributions to building unless the building owner (more widely, the national capital investment which will be placed in building) is getting value for money; and it is for this reason that the organising committee have included among the speakers an economist.

'One thing is important to keep in our minds—that our job is to give a service, and that this service must come from a working partnership of architect, engineer, quantity surveyor and builder—each with his contribution to make to the whole. This inevitably poses the risk of the subservience of the individual and with it the risk of losing that humanism which springs from individualism. But I am sure there is an answer, and that there will be a pattern for the industry during these next stages of evolution.

'Let us now try to find that pattern!'

The Economic Situation in 1980

IT IS, OF COURSE, AN EXCELLENT IDEA to look 20 years ahead (said MR. WOOD). First, one can let one's imagination go; niggling questions such as whether or not this or that is politically possible, whether we shall be able to afford it, are swept aside. A further incidental advantage is that no one will check the prophecies in 1981.

What I intend to say falls under three heads: (a) men, (b) money, (c) the manner of living.

MEN: The first thing to note about 1980 is that there will certainly be a lot more people in this country. In 1950 the population was 50m.; in 1960 it was 52½m.; in 1970 it will be nearly 55m.; and in 1980 it will be 57½m. This means we shall have to make room for an extra 5m. people in the next 20 years. Clearly, this means a lot of extra work for the building industry. Will there be enough people to do it? One figure we want to know about is the labour force employed in all forms of building which we can call construction. A remarkable thing about the construction labour force is that it has remained at almost a fixed percentage of the total civilian labour force over the last 12 years—about 6.6 per cent. The constructing labour force, we must suppose, will increase at the same rate as the increase in the total labour force. Thus the present total of 1,569,000 should increase by 1980 to about 1,652,000, or roughly by 100,000 men.

MONEY: These calculations and some data on money are given in the following Table:

TABLE: BUILDING FROM 1950-1980

	National Income £m	Investment £m	Of which all building £m	Labour force '000	Output per man in building £
1950	14,356	2140	980	1468	668
1955	16,354	2716	1300	1523	854
1960	18,536	3492	1736	1569	1108
1965	20,573	4115	1984	1598	1242
1970	23,312	4662	2245	1609	1395
1975	26,414	5283	2546	1625	1567
1980	29,930	5986	2885	1652	1746

(All money calculations are equated to 1954 prices.)

A Great Building Programme

Most of the annual production of wealth—the national income—we spend as consumers. A fair amount is spent for us by the Government, and there is a balance in our dealings with other countries which need not concern us here at all. What remains is investment, and the table shows what we may expect to take out for annual spending on all kinds of building. It is a rough measure of the demands for architects' services. The assumptions (which admittedly are

The Conference in session

simplified) are that in 1980 the national income will be nearly £30,000m. as against the £18,500m. in 1960. This is based on the assumption that the national income will continue to expand in the way it has done since the end of the war —about 2½ per cent annually. Rather a conservative estimate people would say!

The second assumption is that we shall devote rather more national income to investment than in the past. Investment as a share of the national income has come up from nearly 14 per cent in 1950 to nearly 19 per cent in 1960. I think it will achieve 20 per cent but may not then expand further.

The last assumption (which in many ways is the least sensible) is to suppose that the shares in investment will remain roughly as they are now—i.e., that just about half will go into buildings of all kinds, divided as to nearly 20 per cent of all investment for houses, and 30 per cent for other types of building. I have no doubt in my own mind that these proportions will change.

What, then, emerges from a study of the Table? First, that there will be a very big increase in the actual amount of building to be done from £1,736m. to £2,585m.—that is about a two-third increase. A staggering thought, implying, among other things, the construction of about 500,000 houses a year against recent figures of 300,000.

Increased Productivity Needed

The next thing to note is that the labour force is going to increase very much less—indeed by only about 5 per cent over the 20 years. As a consequence, there has got to be a tremendous increase in the productivity in the industry: output per man will have to improve over the 1960 figures in fact by over half. Can it be done? You may say that the 1960 output per head was almost twice the 1950 output per head but we must remember that the kind of improvement in productivity and industry in the last decade was exceptional and unlikely to be repeated for the same causes. What we have already seen is really the recovery of the industry from after effects of the war, and particularly building controls.

To sum up thus far, there is to be a dramatic further increase in the pressure of work on the building industry, and with it will come an increase in the demand for architects' services. In terms of the index compiled by the RIBA, which shows between 1958 and 1960 new commissions for private architects of about £1,000m. a year, we have (by transferring rates of increase from previous years) a rough figure in 1980 to about £2,000m. Whether the architectural profession is adequately organised to cope with this seems to me to be a fruitful question for discussion. Are offices big enough, specialised enough; are there enough architects?

The Manner of Living

THE MANNER OF LIVING: Whereas we must suppose that the national income will continue to improve, it is more risky to make assumptions about people by projecting rather rigidly the past patterns indefinitely into the future. For it is the distinguishing feature of a free society that it will behave differently from the past just because it is free. The way people will spend their money will change, but I want to emphasise that it looks pretty certain that people will continue to have more money to spend: the picture we have to think of is a continuation of high employment and prosperity with steadily rising purchasing power. But so far as changes in the pattern of spending are concerned, I think that they will be entirely in favour of building—especially housing, even though this is more expensive. I expect that people will economise on other things in order to pay for more houses. Let no one say they will not be able to afford to when, as a country, we still spend 40 per cent. more on alcohol and smoking than all expenses of housing rents and rates, water and housing repairs.

People will also want more in the way of physical facilities for living—we are tired of improvising. Shopping will change because I think by 1980 the Shop Hours Act will be amended so that shops will be open much longer. Why should people who have to work during the week pack all their shopping into their lunch hour or hectic Saturday morning? At the same time another change in law will be the abolition of individual resale price maintenance. A great many small shopkeepers will go.

What must alarm anyone who pauses to think about this is the pressure on the land which exists. Suburbia south of a line from the Wash to the Bristol Channel, with Wales and Scotland as the only remaining open space, is the nightmare which has been with us since H. G. Wells first drew attention to it. I cannot see that there is any other answer than the re-creation of an urban way of living. We must make towns popular again, so that people want to live in them rather than outside them.

We must not forget the Common Market. By 1980 we shall probably have been in this for 10 years. It will mean the movement of people and things, and of ideas too. It will mean more international competition in architecture, and I, for one, welcome this. I do not think, incidentally, that the architectural profession will be able to prevent an architect setting up in practice in this country if he comes from any of the other countries within the Common Market. Equally, it will be quite open to British architects to set up in practice abroad.

To sum up, there will be a tremendous increase still in the amount of building work done in the next 20 years, to be carried out by a labour force only slightly greater than at present, and a tremendous increase in productivity will be needed.

The Saturday Session

ON SATURDAY MORNING the conference listened to brief introductory talks by Mr. Donald E. E. Gibson, CBE, FRIBA, Mr. D. W. Grafton, FRICS, and Mr. David Woodbine Parish, FIOB, before entering upon a general discussion on the Conference subject.

Mr. Gibson's Forecast

MR. DONALD GIBSON spoke first on the architect's view. Following is a synopsis of the points he made:

Ministry of Works recent figures show capital investment in building as £2,040m. A growing world population will require more work, and a higher standard of living will require more frequent rebuilding. He thought that the total building output would be 50 per cent plus in 20 years' time. In addition, overseas nations, for example Africa, would in due time recover and develop and require building services from UK. The European Common Market would require more attention, and the example of CLASP in Germany and Italy should be noted. This meant that a change to the Metric system should be made.

A continuing movement of population from the country to the cities would increase the land famine and encourage higher buildings. The greater proportion of work would be sponsored by public finances; this would mean that more architects would earn their living in larger offices.

The cost of wages would follow the scarcity of labour, and wages would increase so that travelling time and waste of time would be impossible; all architects would be white collar workers, and there would be very few men on any site.

Another view of the delegates in session

New materials, particularly plastics, will develop quickly and will accelerate a much greater use of prefabrication, especially on such systems as CLASP, where we might well see a Government agency set up to sell CLASP to the private sector.

Architects' fees and the fees of quantity surveyors and engineers will have to be fluxed to compete with the all-in-services, and we may expect to see many more joint partnerships and joint fees, as, for example, is being already done by Grenfell Baines, Alexander Gibb and T. P. Bennett. The package deal would survive, but only in the private sector. More architects working in big offices would require group and team working, the teams to contain quantity surveyors and engineers. There would be more cost planning, elemental bills and time on programming.

New drawing office techniques (continued Mr. Gibson) will develop from prefabrication. More time will be given for planning solutions and time will be saved by the use of standard details. The trend will be towards elimination of the draughtsman. Foundation techniques will change, and arrangements for services will be speeded up. Development groups will be started in more public offices but not in the private sector. New interest will be taken in dimensional co-ordination, tolerances, modules and the metric system.

Changes in Tendering Procedure

As for tendering procedure, this will change, and the waste and luxury of competitive tendering will merge into the serial tender and negotiated tenders. Clerks of Works will change in character and become semi-professional staff, such as site architects or engineers. By-laws will be co-ordinated throughout the United Kingdom, and trade literature will be unified in type and dimensions.

Maintenance of buildings will develop as a new profession with maintenance inspectors. These might, unless we were careful, demand a separate professional organisation.

Direct labour organisations with their managers will also increase.

As to architectural education, architectural schools will increase in numbers and capacity and the training of architects will change to be joined with that of quantity surveyors and structural and mechanical engineers. I hope to see less time spent by students on big thesis designs and beaux arts drawings, but more on programming and drawings as a means of conveying information from the architect to the builder.

Now to the building contractor. The small contractor will disappear or be taken over by the larger contractors who can offer good careers, superannuation and continuity of employment. More mechanical plant will be used by the contractors; possibly Government help will be given to the smaller firms.

Retention bonds in the building industry should be abolished and a new National form of insurance, which would be cheaper, should take its place.

Architects should be permitted to join contractors as directors. Many more architects will be needed not only for the UK but for building programmes in the developing countries. As for the quantity surveyor he will develop the use of punch cards and computers as aids.

Mr. P. W. Grafton's Talk

THE DEMAND for housing and ancillary buildings will rise with increasing population coupled with obsolescence. Mr. Wood's estimate, if anything, is on the conservative side. An increased demand for quality and quantity will mean greater proportion of total expenditure on building in twenty years' time than today.

Our present building capacity is inadequate for present demand, and we must, by efficient design and management, minimise the call on resources and, by better organisation and improved techniques, increase speed and capacity of building potential. These are interdependent. It is generally accepted that one important step is increased prefabrication and standardisation of components, leading to greater 'industrialisation,' i.e., off-site factory production, coupled with minimum labour in site operations, further reduced by increased use of mechanical plant. The best use of resources can be made if they are organised to meet an overall building programme. I envisage that the lead must be given by government and others responsible for provision of building in public sectors of economy. For proper control, must there be central direction? Does rationalisation mean nationalisation? If government agencies (M of E, M of H, M of W) can organise a concerted programme of demand based on standard designs, can it be left to private industry to supply 'ad hoc' or should the government arrange long term contracts?

How much standardisation? There are many competing types of components and systems of installation at present. Would it make for speed and economy if there were fewer? The fewer and larger the individual components, probably the less flexible their use. Is it enough to standardise smaller components—with sizes based on an agreed module (ISO 10 c.m. or 4 in.). Would this facilitate greater variety in design? A consideration is the optimum size of site handling by mechanical plant. And if standardisation of building components, why not standardisation of building regulations?

It is extremely unlikely that in 20 years traditional techniques will have been altogether displaced. Specialised 'craft' operations may still be required. To what extent should they consciously be preserved? This will be a matter for designers to decide in leading public taste and opinion.

A Threefold Problem

Assuming overall building programme and adequate supplies of materials, other requirements in meeting our problem are DESIGN, CONSTRUCTION and COUNTING THE COST.

DESIGN: Design of standardised components must necessarily be a joint affair between designer, engineer, builder and manufacturer, with advice from scientists. This could possibly be effected under joint control at Institution level but likely to be more satisfactory under regional arrangements, *vide* CLASP.

But the function of the designer is much more. Although largely influenced by availability of new materials and the development of new construction techniques, he must still embrace a responsibility to society in other respects e.g. interpretation of aesthetic and spatial requirements in the light of changing economic and social conditions; the erection of shelter and environment to satisfy man's physical, spiritual and emotional needs; all the more because of the possible need for greater uniformity in construction. (Is there not, in this respect, a duty on designers not only to direct the use of materials already developed but to take advantage of the technical advances in molecular physics to say what kind of materials and in what shape they require to be created for this purpose?) In addition, there would be an obligation on designers to design economically and for low maintenance.

CONSTRUCTION: The main function of construction would be to get the building up in accordance with design and specification in the right quantity at, and in, the right time. This would mean bringing the construction resources of the building industry to bear the maximum efficiency on each phase of an overall building programme. Efficiency = elimination of waste, which means that the whole capacity of the industry is being fully employed continuously. Can this be achieved by the industry itself, by internal organisation? Will external direction of labour and material resources be necessary? Or can it be left to sort itself out on the basis of 'ad hoc' selection by competition or otherwise?

COUNTING THE COST: Whatever the conditions in 20 years time, there is bound to be a necessity for expert understanding of design-cost relationship, so that design may be based on reliable cost advice; for using comparative cost as a factor of choice, not only of design, but of the firm responsible for constructing the building and for counting cost and assessing payments properly due for work executed.

Personnel and Fields of Responsibility

It seems clear that the main function of design, as defined, will be exercised by the architect. But with increased use of mechanical plant and greater applications of science and technology in building construction and the installation of services, where must the designer draw the line? Should he, like Nervi and Candela, be engineer and contractor as well as designer? Probably not the contractor, but to get the best into design, he should have an understanding of building engineering problems and their solution e.g., the use of mechanical plant. Can this best be done by training a building engineer, having engineer(s) on his staff, using consulting engineers or inviting co-operation in design from the contractor? (Danger here of confusion of account-

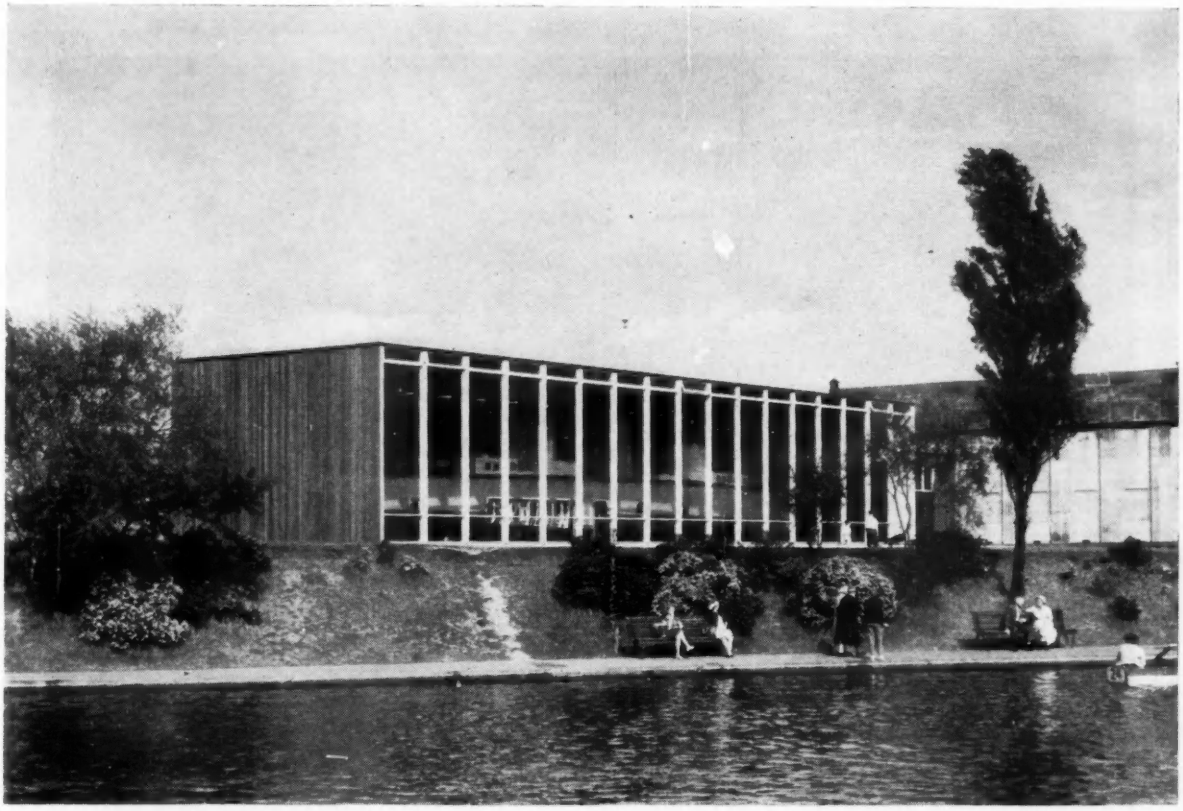
(*Continued on page 535*)

Municipal Museum of Science and Engineering

Newcastle-upon-Tyne, to house SY Turbinia

GEORGE KENYON, DIP ARCH, ARIBA, city architect

A. H. ANDERSON LTD., contractor for A75 system

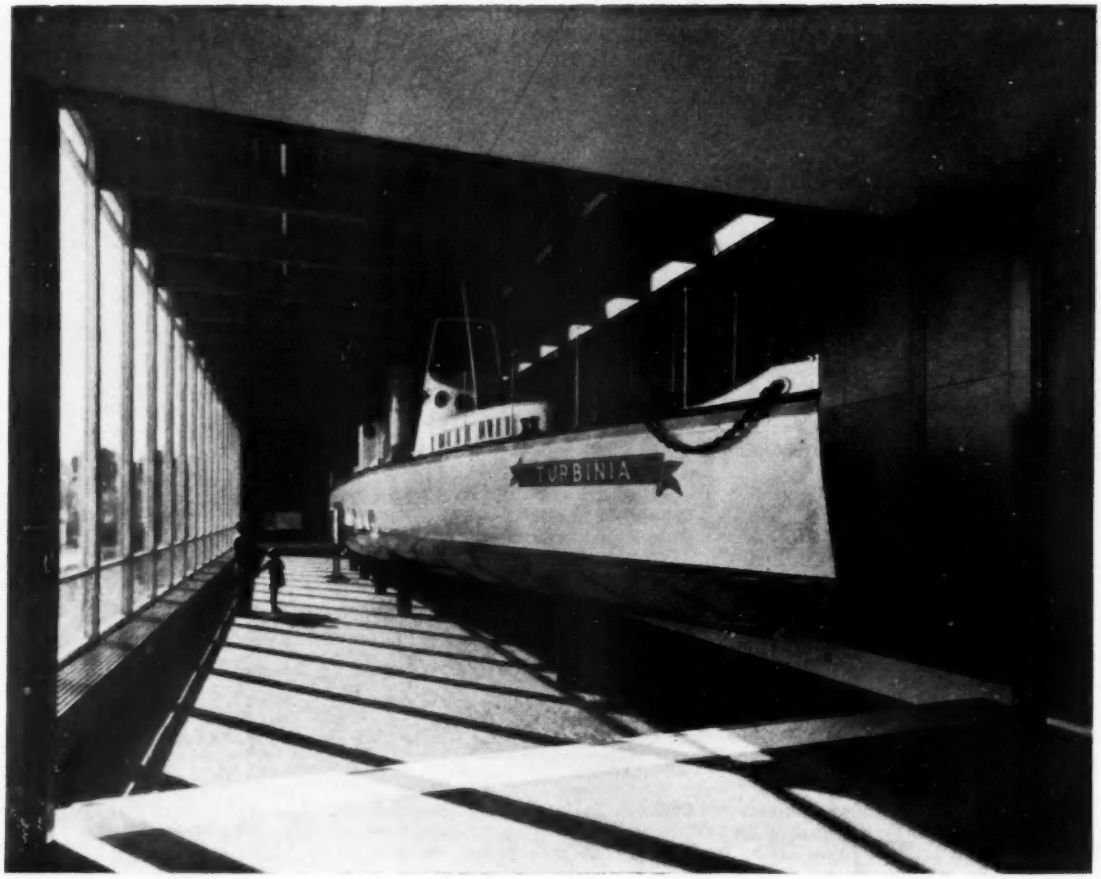


THE ANNEXE TO THE MUNICIPAL MUSEUM OF SCIENCE AND ENGINEERING which the First Sea Lord and Chief of Naval Staff, Admiral Sir Caspar John, GCB, opened on September 15, houses a historic craft—SY *Turbinia*, a vessel which embodied the steam turbine invented by Charles Parsons and was, in fact, the first turbine-driven vessel in the world. *Turbinia's* first preliminary trial was made in November, 1894, but she drew world attention at the Spithead Review in 1897 when she reached the spectacular speed of 34 knots. Even today, the hydrodynamic lines of the craft compel admiration.

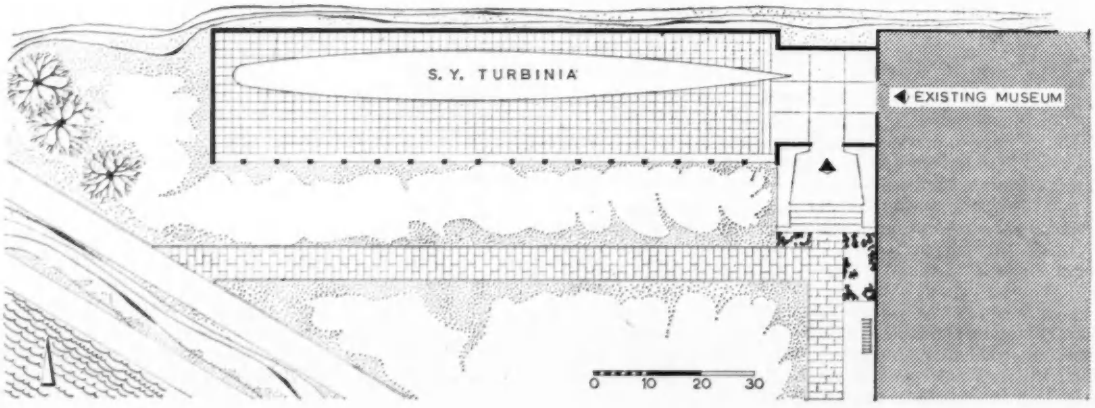
The building in which she is housed—built with funds raised by the North-East Coast Institution of Engineers and Shipbuilders and the Newcastle Corporation—has the cleanness of line and precision of construction that Parsons might well have admired. It has been built on the A75 system by A. H. Anderson, Ltd., in accordance with drawings and specifications prepared by the City Architect. Work on the foundations began in September last, incorporating pockets to receive the six steel cradles on which the 100 ft. long vessel, weighing some 30 tons, would rest. Two months later the vessel was brought on site in two portions, placed on cradles and welded together amidships. Work then proceeded on the erection of the prefabricated building units which form a single-storey building based on a 6 ft. 3 in. module, approximately 106 ft. long with a clear span of 25 ft. The A75 system was fully described when illustrating an office extension for the LCC ('The Builder' of October 21, 1960) and has here been employed using a structural frame of Douglas fir and a single span roof of 2 in. t. & g. boards carried by plywood-faced box beams; underside of roof is wrought and treated with a clear cold-setting lacquer. Roof covering is a 3-layer bituminous felt with a box gutter at eaves. Internally the large wall panels are in gaboon-faced plywood. The south elevation is completely glazed with polished plate glass. In the entrance lobby facing entrance doors is a fine bronze plaque of Sir Charles Parsons, privately donated. The designer's early drawings and illustrations are on display, together with the 6 ft. long prototype model of *Turbinia*, used by the inventor for research on hull design.

Assisting the City Architect were Herbert Padget, ARIBA (Deputy City Architect), T. Finlay, DFM, ARIBA (Chief Assistant Architect), J. L. Bell (Clerk of Works) and Harry Hunter, OBE (consultant marine engineer).

SUBCONTRACTORS AND SUPPLIERS WERE: Robert Anderson (Builders) Ltd., *foundations;* The Wallsend Slipway & Engineering Co. Ltd., *restoration of ship;* Pickfords Heavy Haulage Co., *transport of ship;* J. R. Rutherford & Sons Ltd., *joinery and thermoplastic tiling;* M. Johnson Ltd., *painting;* Terrazzo & Tile Co. (Newcastle) Ltd., *terrazzo;* and G. Mancini, *casting of bronze plaque.*



View showing SY 'Turbinia': below, lay-out: facing page, general view of interior



More Everyday Things

BY ARTHUR W. KENYON, CBE, FRIBA

60. The Architect's 'Can'

I ONCE WROTE an article in this series which I called 'Carrying the Can.' In it, I wrote of the poor architect who stands at the end of the line and carries the can for the rest of the team. It is a familiar pastime in all walks of life and there is no need for me to explain to readers of this newspaper what I mean by it. It is a game we all play, and, although I may have occasionally complained of the architect's unfair allocation of can-carrying, I have hitherto accepted the burden as one of the occupational hazards of the trade. When I talk to my fellow conspirators engaged in the plot of trying to put up architecture in spite of the hazards I find they too accept with resignation their role of can-carriers, although all agree that the can tends to become increasingly heavy and a little alleviation of the burden would be more than welcome.

The metaphor has become wearisome; and I too have become a little weary of this game of good humouredly accepting the charge that every fault to be found in a building must ultimately be laid at the door of the architect. When I was young and inexperienced and anything went wrong on my building, I think I was humble enough to realise that I might have made a mistake and I eagerly set about putting it right. In later years I was mature enough to know, irrespective of who was to blame, that the responsibility was mine and I had better get the fault put right as fast as I could.

I now find there is still another stage in the 'ages of the architect.' There comes the time when for your sins of experience and seniority you become a consultant and you are faced with the task of really deciding who is to blame, for nothing less than blame will satisfy your present-day building owner. Whereas in our personal practice it behoves us all to be ever mindful of the Cromwellian admonition to consider the possibility of being wrong, I now find, when considering the alleged failures of my colleagues, that I do well to keep in mind the possibility of their being right—which they very often are. Yet, even though in my judgment they may be right, those who consult me demand a culprit, and if not the architect, then please say who—the lawyer is sitting there waiting for my answer.

This is far too complex a subject to examine fully in this column. Wood shrinks, plaster cracks, doors warp, windows jam, rain comes in and handles come off. Even if the architect's original details were all right, what about his responsibility for supervision? If something is wrong which costs money to put right, no truth is sufficient which does not bring money in its train, and where better to find money than in the coffers of the insurance company which drew up the architect's indemnity policy? Oh no! this business of can-carrying is no longer a columnist's joke.

Letter to the Editor

Medieval Building Practice

SIR,—In his most interesting review of Mr. John Fitchen's 'The Construction of Gothic Cathedrals' in your last issue, Mr. James Burford referred to 'a wide lacuna in our knowledge of medieval building practice.' I have not read Mr. Fitchen's book, but I wonder whether this lacuna is as wide as appears to be suggested. My reason for saying this is the immense amount of information on the subject in Mr. John Harvey's 'The Gothic World.'

In this he proves clearly that the so-called master masons were really architects and that the Gothic style was largely diffused by means of the drawing board. On the manufacture of materials and building methods he writes: 'The application of machinery was still in a rudimentary stage, but columns and capitals, of stone, marble and wood, were turned in the lathe . . . But though the machinery of manufacture was still in its infancy, other machinery, of process, was not. The classical treatises of Vegetius and Vitruvius were studied . . . Eliminating the details of the classic orders, almost the whole of Vitruvius was applicable to Gothic architecture, engineering, mechanics, and art generally; hardly any of the technical aspect of the work but can be paralleled in medieval practice.'

Again: 'An important branch of medieval building was concerned with the equivalent of modern "contractors' plant," the ladders, scaffolding, tools and especially machinery needed on large and high buildings. The early masons and carpenters were also skilled in military engineering and siege craft, and were the experts of their time upon the problems of mechanics.'

Further quotations would take up too much of your space and probably infringe Mr. Harvey's copyright. I do not, of course, suggest that Mr. Fitchen's book is not one of first-rate importance, nor that Mr. Harvey's 'The Gothic World' answers every problem of medieval building practice that Mr. Burford may have in mind, but the latter work seems to be indicated for parallel reading with the former.

INTERESTED.

Queen Elizabeth College, London

MESSRS. NORTHCROFT, NEIGHBOUR AND NICHOLSON were the quantity surveyors for the Queen Elizabeth College, the University of London, illustrated in our issue of September 8. We regret that another firm was inadvertently connected with the work. Messrs. Northcroft, Neighbour & Nicholson, one of the oldest-established firms of quantity surveyors in existence, have been associated with the building work of the College since it was founded fifty years ago and have been responsible for the quantities for every building since erected.

Cricket

THE LMBA Cricket Club concluded a not very successful season with a rain-spoiled draw against the RIBA at Bromley, on September 6. The RIBA batted first, and in spite of losing an early wicket were able to declare their innings closed with a score of 176 for 5. When rain stopped play the LMBA had scored 57 for 3 in reply. Scores:

RIBA

A. Powers c. Vidler b. Bates	0
A. E. J. Morris c. and b. Vidler	73
G. Fryson c. James b. Cload	27
P. Johnson run out	24
W. E. A. Beeston not out	46
D. Bristow b. James	2
D. L. Robinson not out	2
W. Spooner, D. A. Stevens, B. Gover, C. A. R. Norton — Did not bat	
Extras	2
(for 5 wkts. dec.)	176

Bates, 1 for 26; Cload, 1 for 37; Ashburner, 0 for 42; James, 1 for 32; Hart, 0 for 10; Wright, 0 for 15; Vidler, 1 for 12.

LMBA

F. Vidler b. Stevens	0
D. Hutton b. Stevens	15
W. A. Lawson c. Norton b. Stevens	4
A. Cload not out	22
C. H. P. Trollope not out	9
R. James, S. W. R. Wright, J. R. Garrett, R. Ashburner, R. Hart, M. Bates — Did not bat	
Extras	7
(for 3 wkts.)	57

Stevens, 3 for 15; Spooner, 0 for 3; Gover 0 for 14; Morris, 0 for 18.

Results of the other LMBA games during the season are: a win against NFBPM by 5 wickets; defeats by 56 runs at the hands of the RICS and by 9 wickets against Blue Circle; and an exciting game against LCC Architects which was lost by 9 runs.

Vidler has continued to be the mainstay of the batting—he has scored 233 runs for the LMBA in 5 innings, but there has been no outstanding bowler this year and perhaps this, coupled with some fielding lapses, has been a factor affecting the Club's results.

Police Station, Clerkenwell

J. INNES ELLIOTT, B.ARCH, FRIBA,
chief architect

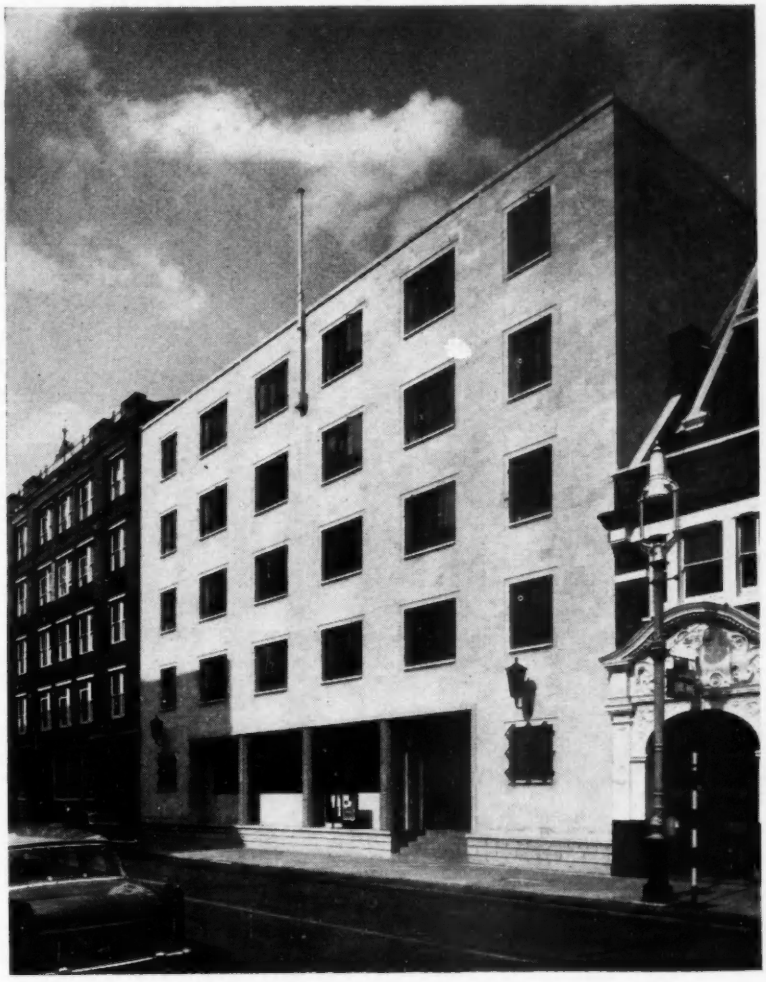
A. A. L. COLLIS, OBE, MIMECH.E,
chief engineer

R. H. COWLEY, ARIBA,
senior architect in charge

T. F. BURNS & PARTNERS
structural engineers

DAVSON & PRICHARD
quantity surveyors

KIRK & KIRK LTD.,
general contractors



THIS NEW STATION for the Receiver for the Metropolitan Police District, is at City-road, Clerkenwell.

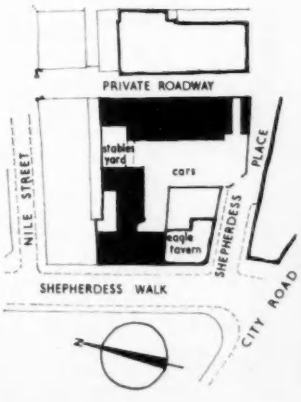
The building is on the site of the old Station and Section House where it has been necessary to provide a temporary premises maintained in operational order throughout the duration of the building works. Accommodation is provided for: (a) the Commander and headquarters staff of No. 3 District, mainly on the third and fourth floors; (b) the headquarters staff of 'G' Division, mainly on the second floor; (c) City-road Sub-divisional Police Station, mainly on the first and ground floors.

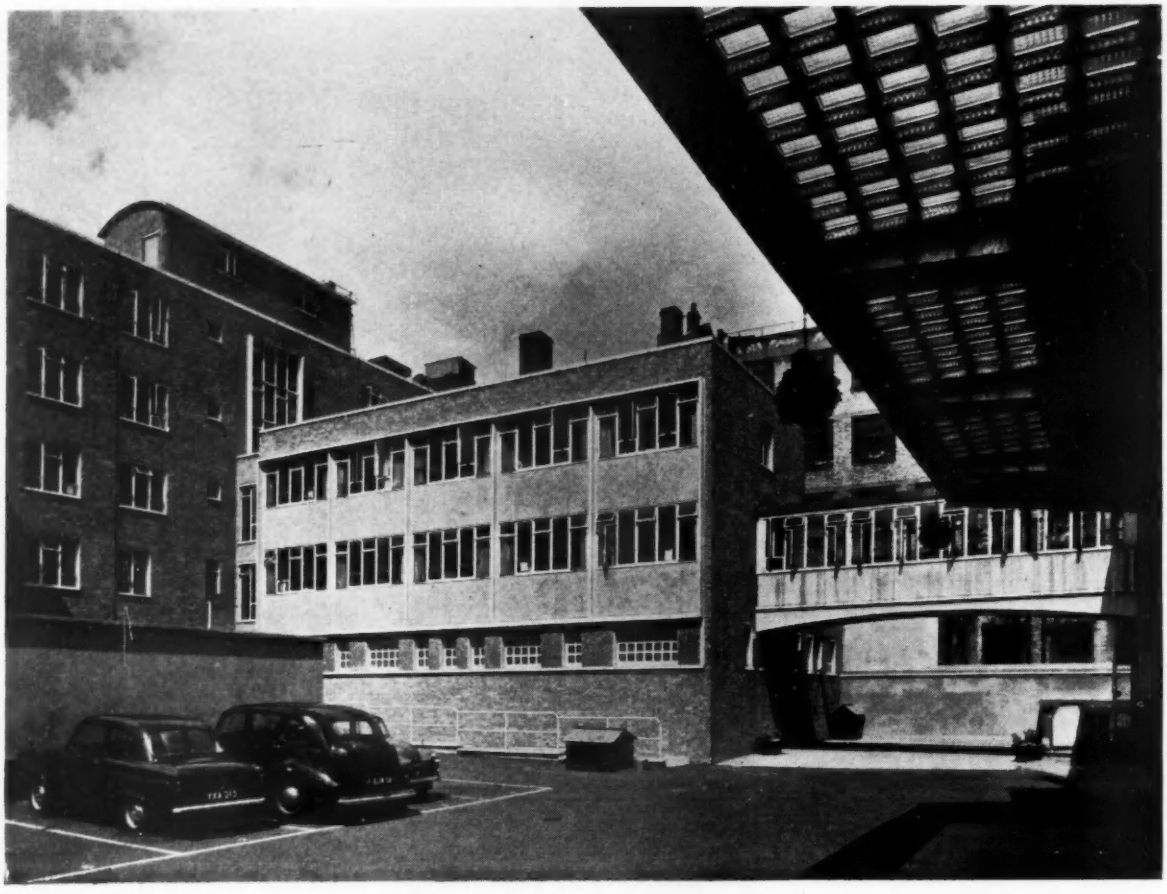
Apart from numerous private and general offices in these departments there is a conference room, lecture room and a parade room. The charge room, surgeon's room, matron's room, detention rooms and cells are secluded and away from the public entrance and inquiry office. Storage and bicycle accommodation are provided in the basement, together with clothes drying room. The rear block contains the kitchen, canteens, library and recreation room on the first floor, a large garage off the main yard, and a rifle and revolver range in the basement.

Stables, offices, etc., and changing rooms are provided for the mounted police, and the stable yard is separated from the adjoining yard and the motor vehicles which use it.

The planning problem was mainly to incorporate the different units and accommodation into an efficient whole, and to let in plenty of sunshine and natural light. A feature has been made of electric light fittings, externally and internally.

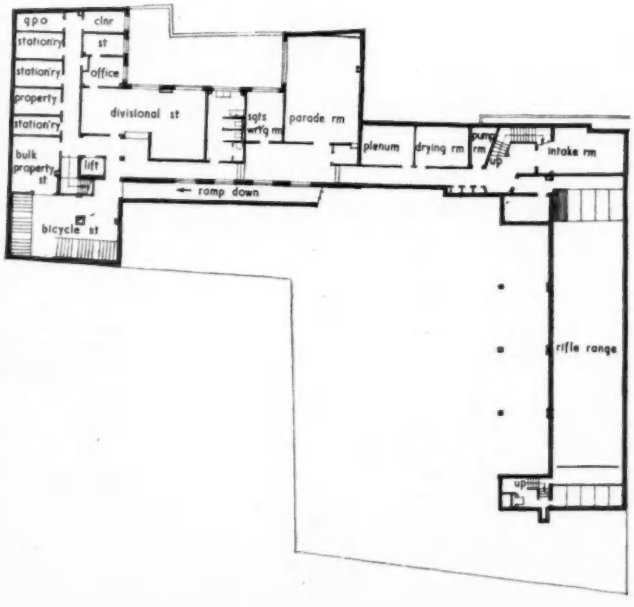
Above and right, general view and detail of the main frontage to Shepherdess-walk





rear elevation and bridge link to recreation block

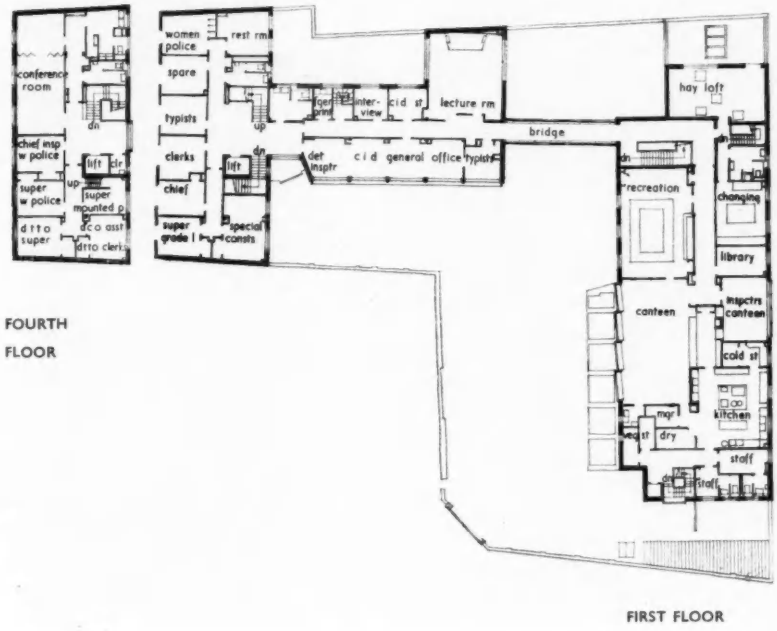
main staircase



BASEMENT, Scale: 1 in. = 48 ft.

The building is steel framed, and it was designed during a critical financial period which rather severely limited the use of expensive finishes. As a consequence, these have been concentrated where they will be most effective. Thus the only natural Portland stone facings are to the Shepherdess-walk frontage and return flank. The ashlar is random-squared-in-course.

Other elevations are faced with yellow stock brick work and artificial Portland stone dressings. Openings which are not in stone surrounds have slender boot-lintels and cills and rendered reveals. There is consistency in the detailing throughout, however, including the sunk necking course below the copings. Steel casements are used throughout except in the main street frontage, where the offices of senior police officers are placed, and the casements are of bronze with frameless sliding internal glazings to muffle street noises. The structural frame is emphasised in the south elevation of the back wing where there is a large panel of windows patterned with coloured and stippled rendering. Under this feature there is a band of knapped flintwork perforated by the lense of the cell windows. The canteen windows are planned 'en echelon,' with window seats inside and Dutch sun blinds outside.



The canteen block. The tender figure was approximately £182,000.

Internally, the main entrance hall is paved with natural Portland stone flags interspersed with Westmorland green slate dots, which is also used for skirtings, strings and stair treads. The walls are lined with Travertine marble and the glazed doors and screens are bronze. The Royal Coat of Arms is engraved on the fan-light over the entrance.

Joinery in public inquiry office, landings, corridors and the more important private offices is of Japanese oak. The conference room floor is rock maple strip, and this wood, together with Queensland walnut, is used in the wall panelling.

Certain doors for the charge room are of teak, and gurjon wood blocks are used for the floors of charge room and parade room.

Colour has been introduced by the use of good quality wall papers in the principal offices and where extra richness is desired on the main stair landings. Corridor floors are covered by linoleum tiles laid to a special basket-weave pattern, and a sympathetic design was selected for the sheet linoleum on the office floors.

Other walls were treated with emulsion paint, and soft-wood joinery with oil paint. A quieter colour scheme is used in the administrative block than for the canteen block. The tender figure was approximately £182,000.

sub-contractors & suppliers:

Demolition: Goodman Price Ltd.; *structural steelwork:* Dawnays Ltd.; *service lift:* R. Reid & Son Ltd.; *cold room:* Ernest West & Beynon Ltd.; *lightning protective system:* Wm. & R. W. Bacon Ltd.; *electrical installation:* London Electricity Board; *heating and ventilation:* Sulzer Bros. (London) Ltd.; *stainless steel sink units:* Crittall-Froy Ltd.; *sanitary fittings:* Stitsons Sanitary Fittings; *steam cooker:* Crypto Ltd.; *cooking range:* Radiation Group Sales Ltd.; *Portland stone facing:* South Western Stone Co.; *bronze windows and doors:* C. E. Welstead Ltd.; *ironmongery and perspex sign:* Broad & Co.

Police Station, Clerkenwell

Above, glazed screen separation between canteen and recreation room. Left, the conference room

Ltd.; *perspex name plates:* Broad & Co. Ltd.; *cell w.c. suites:* John Bolding & Sons; *bronze grilles:* Francis Dudley & Co.; *stable equipment:* Young & Co. (Westminster) Ltd.; *royal coat of arms:* The London Sand Blast Decorative Glassworks Ltd.; *food and water mangers:* Carron Company; *linseed boiling pan:* Radiation Ltd.; *gate ironmongery:* Comyn Ching & Co. Ltd.; *iron balustrading:* P. & F. Construction Ltd.; *galvanised metal windows:* Aygee Ltd.; *plumbing:* R. J. Audrey Ltd.; *Glasscrete canopy and roof lights:* John Healey Ltd.; *marble and granite work:* J. Joslins & Co.; *glazing:* Leay Glazing Service Ltd.; *plastering:* Alan Milne (Plastering) Ltd.; *hand rails:* Marley Tile Co. Ltd.; *cement glaze:* Modern Surfaces; *scaffolding:* Palmers Travelling Cradle & Scaffold Co. Ltd.; *wall and floor tilings:* Parkinsons (Wall Tiling) Ltd.; *French polishing:* Perfection French Polishes; *asphalt roofing:* F. J. Prater Asphalte Ltd.; *metal lathing:* Scaffolding (G.B.) Ltd.; *faience cell wall tiles:* Shaws (G.B.) Co. Ltd.; *in situ terrazzo paving:* Camden Tile & Mosaic Ltd.; *hardwood block floor:* Hollis Bros. Ltd.; *decorations:* J. W. Green (Painters) Ltd.

News of the Week

New Hon. Fellows IoB

THE JOURNAL of the Institute of Builders, which makes its September appearance in a new, convenient and much improved format, contains the news that the Council has decided to limit to 15 at any one time the appointment of Honorary Fellows, a class of which Prince Philip, Duke of Edinburgh, two years ago graciously accepted membership.

The Council now announce that the following have accepted a recent invitation to become Honorary Fellows: The Rt. Hon. Sir Winston S. Churchill, KG, OM, CH; Sir Malcolm Trustram Eve, Bt., GBE; Archbishop Lord Fisher of Lambeth, GCVO, DD; Mr. Ian Murray Leslie, OBE, Hon.ARIBA; Major-General C. Lloyd, CB, CBE; and Sir Hendrie Oakshott, Bt., MBE, MP.

Rome Scholarship in Architecture 1961

THE FACULTY OF ARCHITECTURE of the British School at Rome has announced the award of the Rome Scholarship to Mr. E. Atherden, Dip.Arch. (Manchester). Mr. Atherden is 26 years of age. In addition the Faculty has commended the work submitted by Mr. C. H. Bosel, B.Arch. (Queensland). Mr. Bosel is 24 years of age.

An exhibition of the competition designs submitted is now on view at the Royal Institute of British Architects, 66 Portland-place, London, W1, until September 30. It is open from 10 a.m. to 7 p.m. (Saturdays 10 a.m. to 2 p.m.).

'The Art of Glass'

AT ANSONS, in Dover-street, London, W, a small exhibition, under the title 'The Art of Glass,' is open to the public until September 30, writes Basil Marriott. This consists of work by Helen Turner, Marjorie Findlay, Eric Hilton, John Lawrie, David Peace and Val Rossi. Some of these names are familiar from previous London exhibitions, but most, if not all, have Scottish attachments. Here there is no question of repetitive designs, items being either commissioned works, like Helen Turner's fine rose-bowl, or are otherwise exclusive. Marjorie Findlay's trophy for Shell-Mex and B.P. Ltd. seemed excellent in shape but, as always, I felt that others besides purists might wonder whether semi-naturalistic 'modelling' in the decoration is as apt to the medium as it might be; and again, whether Val Rossi's sandblasted 'sculpture' was the most sympathetic treatment of a material whose prime attraction is crystal clarity—a criticism levelled as long ago as the Lalique era against such experiments, however interesting.

I was glad one example of David Peace's exquisitely crisp calligraphy was included for contrast, however, as well as a reminder of those possibilities of glass 'mosaic' chunks set in concrete which I have urged upon architects. Breaking new ground are Eric Hilton's blown glass vases, with 'colour-cloud' decorations rather like those seen in paperweights, suggesting great and probably highly marketable possibilities. I hope more such exhibitions will follow in Ansons' well-contrived little basement gallery.

An Evening with the Foremen

TO SPEND AN EVENING with that lively body the London Builders' Foremen's Association is to remain convinced that nothing much is wrong with the industry while such enthusiasm and keenness to equip themselves for their important supervisory job are self-evident. At the quarterly meeting held in Caxton Hall on September 12, Mr. A. Derrett presided over nearly a hundred members who heard details of work being carried on in education, recruiting and welfare before sitting-in to a programme of technical films produced by the Costain Film Unit and screened by the Ministry of Works. One of the useful steps being taken is the preparation of a form of service agreement between the general foreman and his employer, and this is now under discussion. The Association is also hoping to arrange a residential course for management.

Surveyors' Associations Liaison

AFTER DISCUSSIONS over a period of some months the representatives of the Building Surveyors Institute, The Faculty of Architects and Surveyors, The Institute of Quantity Surveyors, and The Guild of Surveyors met on September 11, when it was resolved unanimously to meet from time to time to discuss and liaise on matters of common interest, as applicable to the building industry and surveying profession.

Travel Grants for Architects

SIX BRITISH ARCHITECTS have been awarded 30-day foreign specialist grants under the educational and cultural exchange programme of the US Department of State. They are Mr. Stanley Amis, ARIBA, in association with Messrs. Howell, Killick, Partridge & Amis; Mr. David Bristow, ARIBA, LCC architect's department; Mr. H. Cassius Higgins, ARIBA, of Messrs. Higgins, Ney & Partners; Mr. Peter Bosanquet, MA, ARIBA; Mr. S. A. G. Cook, ARIBA, Holborn borough architect; and Mr. L. J. Morton, ARIBA, Messrs. Morton & Lupton. The six will meet in Washington, DC on October 9 for a three to four day consultation period. They will then follow individual itineraries planned in accordance with their own wishes and interests. The grants include a subsistence allowance of $15 (about £5) a day and travel within the United States. Each member of the group is, however, responsible for his own return passage to America.

Municipal Engineers' Self-Help

THE INSTITUTION OF MUNICIPAL ENGINEERS, which is proposing to purchase a lease for 89 years of No. 25 Eccleston-square for use as its future Institution headquarters, is making an appeal to members for £50,000 of the purchase sum required. This is because of the difficulty facing those bodies who seek Bank loans at the present moment. The Institution has now circulated to its 5,000 members an invitation either to make interest-free loans or to pay subscriptions in advance.

This form of self-help, rare enough in these days, deserves to score a success. One member has already offered to lend £1,000. The average sum per member required is £10.

More About the Lord's Wicket

THE FURTHER SURVEY of the 'square' at Lord's cricket ground, carried out on September 11, has been made with Mr. Gordon Tomalin's accustomed celerity. Directed towards locating the now notorious 'ridge' (referred to in an article in 'The Builder' of July 14), over 1,300 levelling observations were made within a period of 4 hours—a rate of five observations per minute. Mr. Tomalin modestly says that this was achieved by planning the operation thoroughly and by using the most modern instrument available. The findings, and what treatment of the wicket will result, must await an announcement by the MCC committee, but between them and Mr. Tomalin, this 'sacred square of England' is in good hands.

Garden of Remembrance, Liverpool

THE Imperial War Graves Commission are to build a garden of remembrance in the grounds of Liverpool Anglican Cathedral. The layout is incorporated in plans which were passed on September 13 by Liverpool Corporation parks and gardens committee.

London Eyesores to be Cleared

ON MONDAY, September 11 last, a team of 25 young men and women from 11 European countries, organised by the

'It's not always easy to decide who is redundant when work slackens off!'

International Voluntary Service, started three weeks' work on the clearance of two large derelict sites owned by the London County Council at Hampden-road and Arundel-grove, Islington. The sites will be used as simple gardens until their permanent redevelopment in three years' time; part of the site at Arundel-grove will become a playground, with climbing equipment made of timber provided by the National Trust.

The London County Council are paying the cost of fencing, seats, turf and other material and for food and shelter for the team. The crowning touch will be the planting of several 40-ft. trees, which have been given by the National Trust and will cost £25 each to install. The work is being organised by the Civic Trust, and the sites will be maintained by the Islington Borough Council.

Westminster Redevelopment

MR. HENRY BROOKE, the Minister of Housing and Local Government, has amended the county of London development plan to schedule for redevelopment a site in the area of Parliament-street, Bridge-street, Victoria Embankment and New Scotland-yard, Westminster. It is proposed that this site, with Richmond-terrace already owned by the Ministry of Works, should be redeveloped by the Ministry of Works as Parliamentary accommodation and Government offices before 1972. The amendment to the development plan was proposed to the Minister by the London County Council on September 30 last year and a public inquiry was held on March 7. The inspector who held the inquiry recommended no modification of the proposed amendment.

Professional Announcements

MR. T. JEFFREY YANDELL, ARIBA, announces that following the death of his partner Mr. P. Neville Taylor, ARIBA, the style of the practice will be changed from Taylor and Yandell to T. Jeffrey Yandell, ARIBA, MSIA, 18, Whiteladies-rd., Clifton, Bristol 8 (tel. No. 30515). The change of style will take effect from October 1 next.

MR. JACK GODFREY-GILBERT, FRIBA, M INST RA, has taken MR. MICHAEL WOLSTENHOLME, ARIBA, AA DIPL. (HONS) and MR. W. H. CARTER, AFS, building surveyor, into partnership. The practice will be known as MESSRS J. GODFREY-GILBERT AND PARTNERS and will continue from 1-3 The Broadway, Wimbledon, London, SW19 (tel.: WIMbledon 6131), and Arcade-chambers, Bognor Regis, Sussex (tel.: Bognor Regis 3824).

A Hundred Years Ago

From The Builder of Sept. 21, 1861

HOUSE BUILDING BY MACHINERY.—We have before us a very remarkable collection of 948 mouldings, including architraves, cornices, cappings, handrails, sashbars, mullions, etc., etc., struck by steam machinery at saw and moulding mills in Liverpool. Each pattern is numbered, but only a few are priced, which is to be regretted. The collection includes a number of doors, sashes, and casements, of various sizes and forms, which can be made, we suppose, at a cheaper rate than in the ordinary way, and may be viewed as a step towards the entire production of buildings by machinery, at a considerable reduction in cost, as in boat-building and gun-making.

Obituary

Walter H. Godfrey; Harold Cherry; H. H. Ford

WE REGRET TO RECORD the death on September 16 of Mr. Walter Hindes Godfrey, CBE, FRIBA, the eminent architect and architectural historian. He was 80.

Walter Godfrey began his career as an articled pupil of James Williams, who had been a partner to George Devey, a pioneer in the revival of English domestic architecture. He studied at the Central School of Arts and Crafts, started practice in 1905, and in 1906 won the Essay Silver Medal of the RIBA. He was elected a fellow of the institute in 1916.

The greater part of Godfrey's architectural work was done first in partnership with E. L. Wratten and later with his son Emil Godfrey. His speciality was the restoration of old buildings and with Wratten he was responsible for the re-erection of Crosby Hall in Chelsea, for work in the Eton College Memorial Chapel, and restorations at Sudeley Castle, Herstmonceux Castle and many other important historical buildings. His most important restorations in recent years were those of the Temple Church and Chelsea Old Church.

Godfrey's profound interest in history and topography lead him to become a member of the London Society and vice-president and honorary secretary of the London Topographical Society. He was chairman of the London Survey Committee, vice-president and honorary secretary of the Royal Archaeological Institute, and a member of the Sussex Archaeological Society. He assisted the Royal Commission on Historical Monuments (England), was formerly examiner in Renaissance architecture for the RIBA, and a member of the council of the Royal Drawing Society. He was vice-president of the Council of British Archaeology from 1952 to 54 and a trustee of the London and Soane Museums.

As an editor and author, and by virtue of his consuming interest in the history and topography of London, Godfrey was responsible for several of the volumes of the London Survey Committee (now the LCC Survey of London). His publications include 'A History of Architecture in London,' 'The English Staircase,' 'The Parish of Chelsea,' and 'The Story of Architecture in England.' He contributed articles on architecture and archaeology to various periodicals.

Walter Godfrey was director of the National Buildings Record from its formation in 1941 until 1960, when he resigned for health reasons. He was appointed CBE in 1950.

Harold Cherry, FRIBA

THE DEATH occurred on September 17 of Mr. Harold Cherry, FRIBA, of Harmer Green, Welwyn, Hertfordshire. He was 81.

Hugh H. Ford, FRIBA

THE DEATH OCCURRED of Mr. Hugh Hubbard Ford, FRIBA, of Cornfield-road, Eastbourne, who was responsible for a great deal of the recent housing development in that town. He was 62.

Arthur Ward

THE DEATH has occurred of Mr. Arthur Ward, borough surveyor of Shrewsbury from 1914 to 1945; he was 84. Mr. Ward was responsible for the construction of the English Bridge, the main road link over the Severn at Shrewsbury, which was opened by the Prince of Wales in 1927.

Coming Events

FRIDAY, SEPTEMBER 22

MANCHESTER BUILDING CENTRE.—Exhibition: '4,000 Years of Mexican Architecture.' 115 Portland-st., Manchester 1 (until Sept. 30).

TUESDAY, SEPTEMBER 26

ASSOCIATION OF MUNICIPAL CORPORATIONS.—Annual meeting. Leas Cliff Hall, Folkestone, 2.30 p.m.

INSTITUTE OF QUANTITY SURVEYORS (London Branch).—'From Tender to Final Account,' by Mr. T. R. Carpenter, 98 Gloucester-pl., W1. 6 p.m.

THURSDAY, SEPTEMBER 28

HOUSING CENTRE TRUST.—Address: 'The Next Five Million Houses,' by Mr. J. R. James. 13 Suffolk-st., SW1. 6 p.m.

ELECTRICAL ENGINEERS EXHIBITION.—Second exhibition dinner. Grosvenor House, W1. 7 p.m.

FRIDAY, SEPTEMBER 29

INSTITUTE OF ADVANCED ARCHITECTURAL STUDIES.—Course on Waterside Buildings and Waterscape. Micklegate, York. 5 p.m. (until Oct. 3).

SATURDAY, SEPTEMBER 30

SPAB.—Visit to Bradford-on-Avon. Paddington Station. 9.5 a.m.

TOWN AND COUNTRY PLANNING ASSOCIATION (PLANNING FORUM).—One-day visit to Bedfordshire. Depart St. Pancras. 9.25 a.m.

Competition News

University of Liverpool

AS BRIEFLY REPORTED in last week's issue, architects are invited to submit designs for halls of residence for 1,100 to 1,200 students on the Carnatic site at Mossley Hill, Liverpool. The cost of the buildings will be approximately £1½m. The assessors are Sir James Mountford, MA, DLitt, DCL, LLD, the vice-chancellor of the university, Mr. D. E. E. Gibson, CBE, MA, FRIBA, MTPI, and Professor Myles Wright, MA, FRIBA, MTPI. The premiums offered are £5,000, £3,000 and £1,000 for the designs placed first, second and third respectively. Further premiums to a total not exceeding £2,000 may be awarded at the discretion of the assessors for other designs of merit. The last date for the receipt of questions is January 1, 1962, and designs must be forwarded to the Registrar, University of Liverpool, Liverpool, 3 (from whom Conditions may be obtained upon receipt of a £3 deposit) by September 4, 1962.

A MODEL AND DRAWINGS of the 'Sunday Times' 'House of Today,' is on view at the Building Centre, Store-street, London, WC1, until tomorrow, Saturday, September 23.

Building in 20 Years' Time

Conference Report continued from p. 524.

ability ?) Design, construction and cost are interdependent. What about economy of design ? Should the architect embrace the whole of the cost knowledge required to assess comparative costs of design solutions or design to a specific cost ? The same person must be planner, designer and co-ordinator, but so long as he can call upon expert knowledge in specialised fields, isn't this sufficient ? Probably the increase in standardisation of components will lessen dependence on specialists.

How far should designers go, in twenty years' time, in providing specification and drawings of constructional detail? Reference to standard components may frequently be sufficient. In other cases, cannot more be left to the expertise of the contractor, if quality and performance standards are laid down? If this is so, how would this affect competitive tendering? Whatever else, the architect must surely see that all information required for constructing the building without waste of time or resources of labour and material are available to the contractor before work commences. And the architect must condition the client to accept pre-contract time for the sake of post-contract efficiency.

The Contractor's Role . . .

The contractor's role will depend very largely on the future competence of the architect. Clearly there are many aspects of planning and design that he should not consider himself responsible for, but where it comes to the techniques of construction, he should, in order to be free to fulfil his function of applying resources with maximum efficiency, be free to use what he has available as effectively as possible. If the design is good and structurally well informed this should be possible; otherwise the design should be modified—but *not* merely to fit the contractor's availability of otherwise unsuitable plant.

. . . And the Quantity Surveyor's

Three functions will need to be performed in twenty years' time which would normally be associated with the QS. Is it necessary for a third party to perform them?

1. *Cost advice to client and architect.* Yes, of increasing importance, but techniques must improve and architects must co-operate.

2. *Preparation of Bills of Quantities.* These will still be required, but may change in character. With more detailed pre-contract information from architects, the contractor will accept simpler measurement and scheduling of requirements. The bill can be arranged to facilitate the contractor's programming and assessment of progress payments.

3. *Price agreement and post-contract accounting.* Despite standardisation of components, site and other conditions may vary and standard pricing is unlikely. Impartial assessment of contract dues will still require independent cost experts. Improvement is required in speed of preparation and agreement of Final Accounts. The method should be simplified. Computers, etc., may assist the QS in preparation of bills and in subsequent accounting, but information must still be processed for 'feeding.'

The selected competitive tender is best, but special circumstances of unusual construction may justify a negotiated contract. The all-in service or package deal is only necessary because of professional inadequacy; there is no guarantee of economy. The negotiated contract under consortium arrangements is the best compromise where proper conditions for competitive tender do not exist.

COATS OFF TO IT ! Seen above are the principal speakers at the conference stripped for action. Left to right : D. E. Woodbine Parish, John Wood, Michael Simpson (chairman JLC), E. D. Jefferiss Mathews (conference chairman), Donald Gibson and P. W. Grafton

Mr. Parish's Address

IN CONSIDERING the probable trends and pattern of future demand upon the building industry in a period of rapid economic, social and industrial change, there is an inescapable need to recognise the fundamental factors which are immutable, even though the frontiers of knowledge and experience are continually being extended. Of the resources available, the one of cardinal importance is Manpower, which embraces both mental and physical potential, for it is only by continuously maximising the latent talents and skills of those engaged in building activity that a sufficiently rapid increase in productivity can be achieved to meet the foreseeable building demands not only in the United Kingdom but also overseas, where there are valuable and exciting opportunities to be exploited. Currently there is a crisis in relation to the quality and adequacy of leadership in the conduct of building work, and as a result the attitudes, morale and discipline of those severally engaged are not as favourable or as healthy as they should be.

Urgent Reappraisal Needed

There must be an urgent reappraisal of the personal qualities of those entrusted with responsibility at all levels and a recognition that integrity, courage, self discipline, a capacity for clear thinking and self expression, together with a positive attitude towards sustained effort to achieve a high level of performance, are indispensable if those engaged in building are to meet the challenge that lies ahead. Individual responsibility must be precisely defined, authority given, and personal accountability rigorously enforced. There are vast areas of waste presently existing through failure to grasp these basic principles and the conduct of building work is currently bedevilled by far too much woolly thinking and low-grade direction which dangerously impairs its performance and adversely affects its profit saving capacity.

Profit is the life blood of any industry —not least the building industry—and training, research, mechanisation, to mention only a few aspects, gravely suffer if inadequate profits are earned for reinvestment in future improvements and expansion. The younger members of the industry who twenty years hence will be occupying senior positions of responsibility must professionally endeavour to foster and sustain more enlightened attitudes and standards of behaviour, so as to create a healthier climate and environment in which genuine co-operation and mutual trust and respect can flourish. The rationalisation of human relationships within the industry transcends every other problem facing it at the present time and lies at the heart of the solution of substantially raising the individual and collective performance of those engaged in fulfilling the complex building needs of the community in the future.

Discussion

BEFORE OPENING the papers to discussion, THE CHAIRMAN said that he hoped it would be remembered, amid all the talk on economics, that we were dealing with people and with buildings for people. Before inviting contributions he would ask Mr. Parish to give an opinion on Mr. Gibson's point about the anticipated growth of direct labour organisations.

MR. PARISH: Simply this. Direct labour will succeed or fail as it is competent or otherwise.

MR. S. MORRISON (A) asked whether it was possible to integrate the work of the architect and the builder?

MR. GIBSON: Yes, but it is possible to arrive at the same economic result by giving the same builder work on a long-term programme. The problem resolves itself into a choice between giving larger, amalgamated, groups of architects and builders continuous work or by following the present practice of waiting for work to come and then giving official help.

MR. ALAN DEAVES (A): I am one who doesn't want the architectural profession to amalgamate. Can we not arrange for a split down the centre with the amalgamationists on one side and the separationists on the other? In ten years' time we can look at the position and see how each side has got on.

MR. S. MORRISON thought that the method of amalgamation of resources and manpower suggested by Mr. Gibson would be the only possible one. We simply could not afford the luxury of the one-off job—though we must make special provision for the occasional cathedral or college.

Ending the 'Muddle-through'

MR. HARRY BRACK (QS) said that for long enough the industry had muddled through, and the time had come to end it. The question was: Were we going to be led? Could high level moral thinking survive over muddled systems? If we wanted to plan, we must be prepared for some measure of control. Was the architect prepared to take the lead? The economist speaker (Mr. Wood) he felt had some bias in his thoughts towards free enterprise, but would a continuance of this system meet the case? As for the quantity surveyor, he could contribute an immense amount in real knowledge for he, unlike the architect, had an objective view of the industry. But the quantity surveyor must discontinue his Victorian ways and, in the American phrase, 'shed a bit of fur.'

MR. GIBSON thought that the approach on the architect's point should be through a more practical training.

On the question of the future form of the economy, MR. GRAFTON saw this as taking a mixed form with the State giving the lead.

MR. S. J. LEWIS (B) said that the challenge that must be faced was that every member of the building industry must come together to produce an economic form of building. One of the obstacles between architect and builder was that the former was paid by fee and the latter on a profit margin. How could this be reconciled? One way was to let contracts in a different way, for instance, by the method of arriving at an approximation of the cost at the beginning of the scheme, based on a schedule of prices. If builders tendered on that schedule at the start of a project, one could then bring him into the team while yet preserving the competitive system.

MR. J. MACKAY-LEWIS said that this conference must know what it wanted to achieve. If men knew what was wanted, they could achieve anything, but the objective had to be there. 'We are losing the best brains coming into industry because we cannot tell them what we are trying to do. We must find out, and make it known.'

MR. W. L. WAIDE (County Planning Officer, Cambridge) said that official needs were now known long in advance, and the industry should be able to establish machinery to carry them out. In so doing, it should be able to reduce cost.

MR. JOHN WOOD said that there was not in the Treasury a single piece of paper to show the total national building needs; the reason was that they could get no figures from the nationalised industries.

MR R. VICKERS TODD (B) asked whether builders should not have certain basic qualifications before being able to set up on their own.

MR. PARISH said that registration, which would cover the matter, would come in time but the subject was tied up with the patterns of trades unionism thought, for both men and their jobs were involved. On the Continent building clients were particularly careful to get the precise qualifications of the builders' directorate before asking them to tender.

MR. R. BUDD (QS) pressed for (1) more research into the means of doing away with wet finishes; (2) more use to be made of computers; (3) a better system of checking drawings before they left the architects' office; and (4) some plans for enabling firms in the industry to keep their key men.

MR. GIBSON, agreeing with the need for research into the elimination of the 'wet' processes, thought this should be tackled by the BRS.

MR. B. M. KING (A) said that no one so far had mentioned the aesthetic qualities of the work we were going to do in 20 years' time. Had consideration been given to town planning and landscaping not as a science but as an art?

MR MACKAY-LEWIS asked what was proposed for the manufacturing industries? Consultants who acted as go-betweens between architect and makers were not always good, and the architect might do better by getting into direct touch with the manufacturers. The industry also needed more and better-presented technical information.

THE CHAIRMAN then stated that the Conference would break up into ten groups to study five subjects as follows:

(1) Resources of manpower and materials;

(2) The organisation best suited to deal with resources;

(3) The development of techniques, particularly in relation to production and the availability of materials; also the part the operatives should play;

(4) The operation of building—the programming, planning and execution of building in its widest sense.

(5) The transmission of knowledge, including the transmission of the results of research.

Saturday afternoon and evening were devoted to the study of these subjects, the ten group leaders reporting back to the conference on Sunday morning, after which discussions on the findings followed.

The Summing-up

Summing up, MR. MICHAEL SIMPSON (JLC Chairman) asked the conference to go away and work towards the conclusions reached. Support was needed from other parts of the country, especially in the formation by the Allied Societies of committees similar to the Junior Liaison Committee, to provide for interchange of problems and information. A report on the present conference would be issued and details given of those particular aspects, which would be followed up. Finally, Mr. Simpson suggested that permission should be sought of the National Joint Consultative Council to change the name of the JLC to the Building Liaison Group.

In closing the conference, MR. E. D. JEFFERISS MATHEWS said he did not propose to give a factual summary—that had already been given by the speakers, and a report would be circulated.

'But the probable economic scene has been set, and this should be the basis of our forward thinking', he said. 'It looks as if it will be a mixed economy much as at present—partially planned, partially free, but with improvements and perhaps state participation. This would be a typically British solution which would suit us and offer a great challenge to make it work; we have the chance to show that it can be a better method than the two extremes of total state control or total freedom. I think general agreement has emerged on the principles which should, and will, develop.

'No one here should expect the millenium to occur overnight,' added the Chairman. 'Things happen slowly, but they go on happening, and the value of these Conferences is that it gives us a sense of awareness and of stimulation. We must pass this on to others; it is wonderful how quickly it spreads, and how development and progress result.'

Those Present

In addition to the four principal speakers and the Chairman, the following were present:

MEMBERS OF THE JUNIOR LIAISON COMMITTEE: Michael Simpson, ARIBA (chairman), Jeremy Mackay-Lewis, ARIBA (organising Conference secretary), Hugh Clamp, ARIBA, Michael Waring, MA, John Simms, ARICS, Ray Budd, ARICS, J. Tiller, AIOB and B. E. Lucas, AIOB.

ARCHITECTS: Hector McDonald, Donald Campbell Thorn, Edwin Hoeing, David Wager, S. Morrison, J. A. Butler, Eric Leach, John R. H. Sargent, E. L. Venables, C. Lea, Mr. Tasker, D. Forster Wicks, A. F. Crawshaw, A. H. Klein, John Hornby, H. G. Stachowski, Alan R. Deaves, Geoffrey Bannister, Simon Alexander, F. C. Goodall, J. S. Horne, P. M. Cowell, Ross McTaggart, John Phillips, B. M. King, L. Mothershall, and D. R. Balfour.

QUANTITY SURVEYORS: E. J. Hosking, B. Drake, J. Ellis, G. A. S. Hadley, D. W. Avery, Thomas Lucas, R. P. Appleyard, Harry Brack, G. Every, J. L. Derry, John C. Large, M. H. Gale, Patrick Leonard, David R. Male, R. R. Mansfield, K. S. G. Fish, David F. Blair, A. S. Morris, R. W. Hayward, James W. A. Asher and Garth Foster.

BUILDERS: J. M. Gillham, R. Vickers Todd, P. J. Boswell, R. Mannerings, N. McKee, J. H. Overton, R. D. Parker, C. T. Bailess, R. N. Chapman, J. M. Cull, A. S. E. Ellett, E. A. Fisher, G. Font, D. Greenwood, L. Hill, P. H. Hatton, D. Jones, S. J. Lewis, J. A. Lyons, M. J. V. Powell, Pun Kim-Chuen, B. F. D. Savage, John Ashfold, Dennis Jones, M. D. Bennett, and V. Barrow.

OBSERVERS: Derek Senior, I. M. Leslie, Mr. & Mrs. M. MacEwan, and W. L. Waide.

New Methodist Churches

An Illustrated Brochure

THE OLD GIBE about Nonconformist churches lacking architectural distinction must have lost its point if one may judge from a well-produced report under the above title, just issued by the Methodist Church Department for Chapel Affairs*. This contains photographs, plans and descriptions of sixteen churches built during the post-war years by the Methodist Church, whose expenditure on building since licensing was abolished has amounted to nearly £14m.

Churches Illustrated

The churches illustrated are as follows: Punshon Memorial, Bournemouth (Ronald H. Sims, architect); Bradshaw Brook, Northwich (Halliday & Agate, architects); St. Andrew's, Wythenshawe (J. C. Prestwich & Sons, architects); Queen's-drive, Swindon (Cripps & Stewart, architects); Bracknell, Camberley (Clifford Culpin & Partners, architects); Northfield, Birmingham (J. P. Osborne & Son, architects); King-street, Plymouth (Sir Percy Thomas & Son, architects); Mitcham (Edward D. Mills & Partners, architects); St. John's, Amersham (Alister MacDonald & Partners, architects); Filton St. Andrews, Bristol (J. Ralph Edwards, architect); Upwell, Cambridgeshire (Thos. F. Trower, architect); Mayflower, Leicester (J. Trevor Sawday, architect); Fulwell Seaburn-Dene, Sunderland (S. W. Milburn & Partners, architects); Derringham Bank, Hull (B. W. Blanchard, architect); Southdown, Bath (F. W. Beresford Smith, architect); and Welwyn Garden City (Paul Mauger, Gavin, Mathers & Mitchell, architects).

It is pointed out in a foreword that the churches selected are not necessarily the best—they are illustrative of the work that has been done. Some are traditional in character, while others are contemporary, but all are clearly places of worship. Every building embodies a church, a hall and ancillary accommodation, and all display skilful grouping of the various parts. Some are inexpensive buildings, while others, of a more elaborate nature, have been made possible by War Damage payments, Connexional and Joseph Rank Benevolent Trust grants, and Church funds.

The Rev. W. Oliver Phillipson, General Secretary, and the Rev. Herbert Simpson, Secretary of the Department for Chapel Affairs, who have been responsible for this brochure, are to be congratulated on their unprejudiced choice of buildings. 'The fastidious student,' they write, 'may not find every building quite to his fancy, but *de gustibus non est disputandum*. It is felt, however, that all the designs are interesting and that the details will be of value,' sentiments with which architects who specialise in church design will, we believe, readily concur.

* Central Buildings, Oldham-street, Manchester 1. Price 1s. 6d.

Flats at Barking

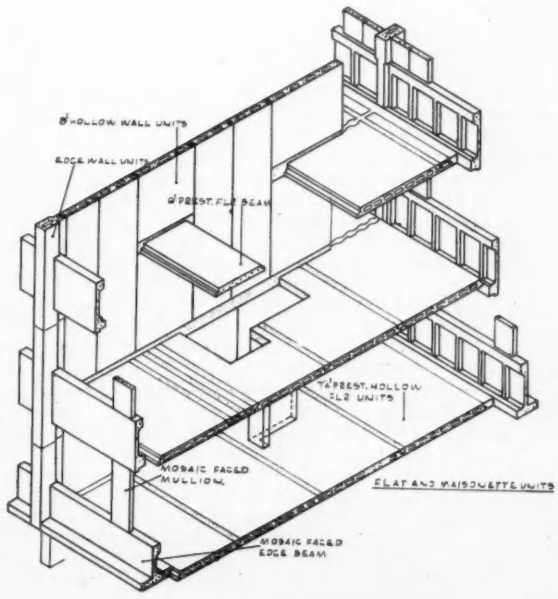
Rapid Precast Concrete Construction

EXPERIMENTS HAVE BEEN CARRIED OUT during recent years by Barking Borough Architect's department in conjunction with Concrete Ltd. in the use of precast concrete for multi-storey flats. The latest project, the Lintons, consists of one 16-storey and three 7-storey blocks which will provide 384 units of accommodation. The design is based on precast load-bearing crosswalls and floor slabs, with longitudinal precast structural panels for cladding. These panels are surfaced with mosaic cast into the concrete during manufacture, as are the quarry tile facings on the load-bearing flank wall panels. Close co-operation between the architect and the contractors from the earliest stage, and the extensive use of precast concrete facilitated quick erection.

The design is on a 3-floor module. Above the ground floor, which is used for garages and services, are 2-bedroom flats, and above this 3-bedroom maisonettes. This 3-floor system is followed in all the blocks. Part of the first floor in the maisonettes is constructed in timber. No scaffolding was required during erection, which was completed on the 16-storey block with the use of one travelling and one fixed tower crane in 25 weeks.

The architect was Mr. M. Maybury, ARIBA, borough architect of Barking. The contractors for the foundations were W. & C. French Ltd., piles being used on the 16-storey and strip foundations on the seven-storey blocks. The main contractors for the superstructure were Hawker-Smith Ltd., and the contract with Concrete Ltd. was placed direct by the Barking borough architect.

FLATS AT LINTON-ROAD, BARKING.—*Left: The sixteen-storey block nearing completion. Below: Diagram showing structural units used in the load-bearing crosswall construction*



Sheffield Redevelopment

£5m. Proposals for Sheaf Valley

DETAILS of a £5m. comprehensive redevelopment scheme in the Sheaf Valley, Sheffield, submitted for approval to Sheffield Corporation, were announced on September 13 by the developers, Estates Property Investment Company.

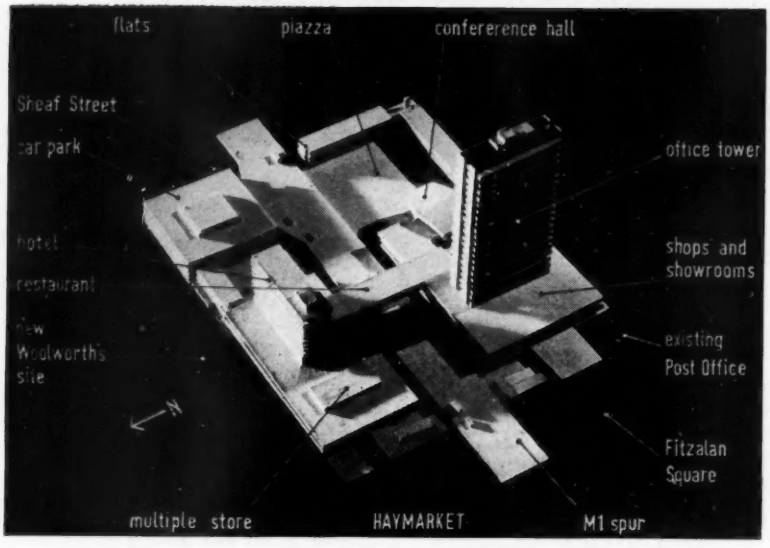
The site covers seven acres and adjoins the heart of the city. It would become the commercial centre of Sheffield. The scheme is dominated by a 25-storey tower block of offices with its own garden and conference hall, rising about a multiple store, banks, shops, showrooms, a new hotel and flats. The plan is now under consideration by Sheffield Corporation, who own a large portion of the land.

The scheme has been prepared by Marsh and Woolf, architects, 3 Old Barrack-yard, SW1, in association with du Bosky and Partners, chartered quantity surveyors. At present the site is about 35 feet below ground level and is isolated from the rest of the city because of the escarpment and difficult access. But with the advent of modern constructional techniques and the scope for comprehensive planning over a large area, the geographical nature of the site can now be turned to advantage.

Its position is at the junction of the city's High-street and Haymarket, singling it out as a natural centre and forming a focal point in the city within the main shopping centre. There is complete traffic and pedestrian segregation. The scheme envisages a pedestrian shopping deck over the whole site, free from all vehicles. It would then be possible to walk from the bus station to the Markets area without crossing a road. A new, wide Commercial-street is planned, raised above the shopping deck and carrying the High-street traffic across the Valley. Under this deck, warehousing and service traffic approach from Sheaf-street with a multi-level car park for 700 vehicles. The 25-storey reinforced concrete framed tower block would rise 260 feet high. The aim is also to provide an 'evening centre' for the city.

Throughout the preparation of the scheme Estates Property Investment Co. and their advisers have aimed to design a centre in sympathy with Sheffield's existing Parkhill and Markets area developments on adjacent sites.

Estates Property Investment Company has other Sheffield and Yorkshire interests including proposals for a 28-acre industrial estate and two housing sites.



The Sheaf Valley redevelopment, Sheffield

TCPA Visit to Bedfordshire

THE PLANNING FORUM of the Town and Country Planning Association has arranged a visit to Bedfordshire on Saturday, September 30. The tour will include the Bedford Central Area Redevelopment, an LCC town development at Houghton Regis, private housing at Ampthill and restoration of chalk workings at Tottenhoe. The cost of lunch and the coach tour (Bedford will be reached by train) is 15s. for members and 17s. 6d. for non-members. Details can be obtained from the Planning Forum Secretary, TCPA, 28 King-street, WC2.

Profiteering in Land

TUC Pass Resolution Calling for Legislation

DURING ITS CONGRESS in Portsmouth on September 7 the Trade Union Congress adopted a composite motion proposed by Mr. R. W. Toms (Association of Building Technicians) calling upon the general council to press the Government:

1.—For emergency legislation to tax all land deals and property development schemes which involve increases in the price of land over present use values;

2.—To make grants to local authorities enabling them to acquire, at uniformly low cost to themselves, land needed for housing and planned redevelopment in any part of their built-up areas.

Profiteering in land, said MR. TOMS, introducing the motion, had become one of the foremost social issues of the day. It was now so flagrant that the TUC must make its voice heard and the General Council should demand immediate action 'to curb the racket.' Local councils were in dire need of sites. In city centres fantastic fortunes were being made in land and property speculation, and in the suburbs private builders were searching for sites to cash in on the demand for homes.

'A Commodity for Profit'

'In private hands land is merely a commodity, like any other, on which to make the maximum profit. Step by step the Government have dismantled the post-war measures to control the price of land. Limited as they are to the slum districts, and to obtaining off sites elsewhere by competing against the private developer, councils will never resolve the dilemma of where to build within their areas.'

MR. G. F. SMITH, Amalgamated Society of Woodworkers, said that London was the great scandalous example of what was happening. Emergency legislation on land prices was essential, but a necessary corollary would be greater control over the drift of industry and population.

MR. E. K. CLARKE, Amalgamated Union of Building Trade Workers, said that in 1953 Middlesex County Council opened negotiations for the purchase of four acres at Sunbury and approved a price of just over £2,000. The circumstances precluded compulsory purchase and little more than a year ago the council made a deal for three acres of the land at a cost of £24,500.

Institute of Arbitrators

Autumn Lecture Series

A SERIES OF LECTURES has been arranged by the Institute of Arbitrators for this autumn as follows:

ARBITRATION AGREEMENT — Nature of Arbitration; Arbitration Act, 1950; Arbitration Agreement. J. R. W. Alexander, CBE, LLB, FIARB. Tuesday, October 10.

DISPUTE — Dispute; Arbitrator; Umpire; Expert Witness. A. B. Waters, MBE, GM, FIARB, FRIBA. Tuesday, October 17.

PRELIMINARY PROCEEDINGS — Preliminary Proceedings; Pleadings; Evidence; Case Stated; High Court. Rt. Hon. Lord Meston. Tuesday, October 24.

HEARING AND AWARD — Hearing; Award; Costs; Appeal; Enforcement. J. R. W. Alexander. Tuesday, October 31.

PRACTICE ARBITRATION — For those attending the Lectures. November 14.

The lectures will be held at 6 p.m. at the RIBA, 66 Portland-place, London, W1. Tickets will not be required except for the Practice Arbitration on November 14. Full details from the Institute of Arbitrators, 27 Regent-street, SW1.

Town Planning and Land Scarcity

Some Reasons for the Inflated Price of Building Land

In his paper to the overseas section of the Town and Country Planning Summer School, sponsored by the Town Planning Institute and held at Reading University from September 12 to 16, Mr. Desmond Heap, LLM, PPTPI, took stock of the development of 'Planning Legislation at Home and Abroad' and discussed the effects of its controlling influences. In the foregoing extracts Mr. Heap refutes two things for which post-war town planning law is being held responsible by some. These are first, the rise in the price of land, and second, the architecture of new buildings now being erected.

I DENY that the rise in the cost of land is disclosing a failure either on the part of the law or on the part of planning control under the law. If it is true that the coming into effect of a development plan may, on the one hand, depress the value of land, it is equally clear that, on the other hand, the plan will in certain circumstances, have the effect of raising the value of land. The last two years have seen something of the nature of a boom in land prices in England and for this, planning controls in general, and development plans in particular, have been blamed. It has been estimated by contracting firms that the average values of building land are now between three and four times as much as they were five years ago.

Contributory Influence

It is easy for those to whom the controlling influences of town planning are anathema to suggest that it is town planning and all that it stands for that is solely responsible for these inflated land prices. It must be admitted that there can be no doubt that the effect of town planning legislation and development plans have contributed in some degree to this rise. Indeed, if this were not so it would be a criticism of town planning and a suggestion that it was failing in its purpose. It is submitted, however, that the real reason for this spectacular rise in prices for land, whilst being partly due to the influence of town planning control, is much more substantially due to the general economic well-being of the country and to the evolving modern style of urban family life in which two adjuncts (both of which cost money and each of which is now regarded as a necessity) namely, privacy and space, are being sought after more and more.

With higher incomes more people are finding that greater living space and increased privacy are just as desirable as those other, but better known, so-called luxuries and alleged signs of a higher standard of living, namely, the television set and the motor car. These are matters which play a very deliberate part in causing increased pressure for building land which in turn sends up the price of land.

When questioned in Parliament on June 28, 1960, about rising land prices the Minister of Housing and Local Government said:

> 'What I am doing, is to ask local planning authorities, in the reviews of their development plans now proceeding, to allocate more land to building beyond the green belts. In addition to that I am seeking to encourage the fullest use of land within the urban areas. But we have to face the fact that the demand in and around the most prosperous towns will continue to exceed the supply, unless we are to abandon planning policies of the restricting of growth of towns, preserving good agricultural land and protecting the countryside; and that I am not prepared to do. What this means is that builders must turn their attention increasingly to redevelopment of older areas within the towns, which is our chief need. I am not prepared to modify the policy of a free market in land, without which of course we should not have had the vigorous building progress of the last few years. What the situation calls for is administrative action of the kind I have described, rather than more legislation.'

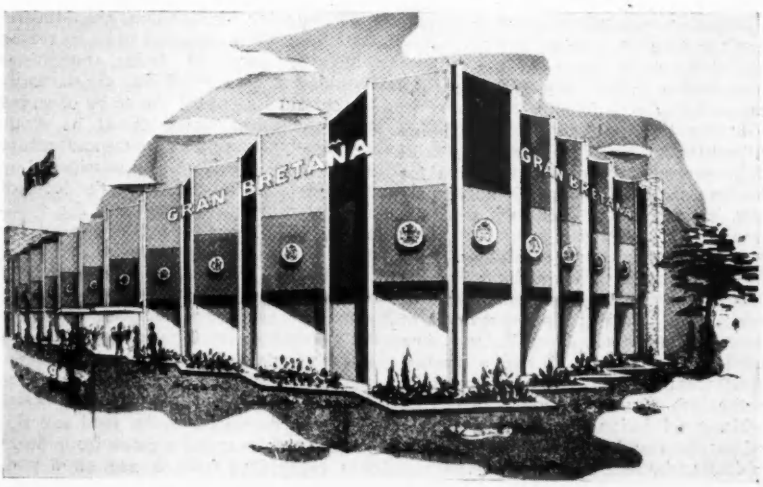
The Minister followed up this statement in Parliament with the issue in August, 1960, of Circular No. 37/60, relating to the review of development plans and dealing with the important matters of (1) extension of the plan period; and (2) allocation of more land for development and more internal use of urban land.

There is, however, another point which needs to be considered in connection with this rise in the value of building land. It would appear that the mere making of more building land available would not necessarily bring land prices down because the land which would be made available might not be available in the places where people want to go. At the moment, and speaking by and large, everyone in the north of Scotland wants to go to the south of Scotland, after which the increased numbers in the south of Scotland wish to pass further south into the north of England, after which the increased multitudes in the north of England wish to move further south again into the south of England. In short, population movements in the United Kingdom tend always to be southwards.

London's Magnetism

The reason for this is not far to seek—it is the paramount magnetic attraction of London. It is clearly not in the interests of the United Kingdom as a whole that there should be undue pressures in the London area and unduly empty spaces elsewhere, though one must accept that there will always be higher population densities near the capital city. It is one of the problems of town planning control to reverse, at least to some extent, this ever-growing pressure upon the south-east corner of England by making other areas equally, if not more, attractive for living and working in. This problem has not yet by any means been solved because it would appear to be the case that thousands of people are prepared to go and live near the capital city and suffer daily the inconvenience which to some might appear intolerable, of high rents, general congestion and near-chaos at peak

BRITISH PAVILION AT LIMA, PERU.—*An artist's impression of the British Pavilion for the Pacific International Trade Fair at Lima, Peru, from October 11 to 29. Four steel framed buildings, supplied by Coseley Buildings Ltd., have been used to enclose an area 180 ft. by 125 ft. in which thirty individual stands will be housed. The Central Office of Information has designed the functional interior layout and the front elevation, the latter comprising 20 ft. tall panels sprayed in light and dark blue between white stanchions above a 10 ft. base of clear glass. The Coseley buildings, portal frame bays, have been arranged to form a square to allow a spacious open courtyard in the centre of the pavilion*



travel times for the privilege of so doing. Town planning has already embraced the concept of the direction of industry, but, heaven forbid, that we should ever see it come to direct population otherwise than obliquely and as a concomitant of the direction of industry.

Is the true function of town planning to stop the general public getting what it wants? If the public all want to live near London, is it the function of town planning to stop this? Can, and ought, town planning to stop the eating up of the metropolitan green belt so as to allow everybody to live near London? What I am clear about is that until the problem of easing congestion in the south-east of England has been solved, land prices will obviously remain high and tend to get higher, notwithstanding the making available of land for building elsewhere in the United Kingdom. It is, however, incorrect in these circumstances to blame, as some have sought to do, town planning controls and development plans for the high prices of building land. On this the words of the Minister of Housing and Local Government in Parliament on July 18, 1960, may be quoted:

> 'No power could prevent land prices from rising in a prosperous country where there is limited land. My business is to see that there is no artificial rise in prices through too little land being allocated for houses which are necessary and desirable. That is what we are doing, and that is why I suggest that we do not panic or dash for quack remedies, that we use present trends as evidence, that we must put land to full use and not waste it, and that we press on with careful forecasts and research and make absolutely sure that we keep all our development plans right up to date both regionally and locally. Above all I suggest that we work with the market forces and seek to harness them to serve national purposes, instead of acting like Canute's courtiers . . . vainly telling the tide that it ought to turn and threatening to tax it if it does not.'

Architecture a Matter of Taste

As to the architecture of modern buildings, this is a matter of taste and has nothing to do at all with planning law. Indeed, it has hardly anything to do with planning control. If anything is wrong with today's new buildings, if it is true that the City of London has become a city of dreaming slabs and has thereby committed a gaff, all this is entirely the responsibility of architects.

It may be the function of planning authorities to turn down the worst of such excesses as come before them for planning permission, but it is not, in my view, their function to embark generally upon the job of redesigning the architectural treatment of new buildings. This could lead to a rash of buildings in some monotonous local government style of architecture. Variety is all—provided, of course, there is a seemly coalescence, one building with another. The art of studied carelessness has much to commend it. In the last resort this whole matter of architectural design is a question of taste and manners and I repeat that it is the architects who bear responsibility.

The Regent Street Polytechnic

Courses for 1961-1962

VARIOUS SHORT COURSES have been arranged at The Polytechnic, 307-311 Regent-street, London, W1, by the Department of Civil and Mechanical Engineering at post-graduate level. The fee for each course is £1 1s. unless otherwise stated. These include 'Prestressed Concrete,' by F. W. Gifford, on six Tuesday evenings commencing September 26, which will deal with the principles of prestressed concrete, methods of pretensioning and post-tensioning materials, stresses and design. Some lectures will be illustrated and prestressing equipment will be demonstrated. A course entitled 'Contractors' Plant' will take place on six Friday evenings from September 29 and will cover reasons for mechanisation, operating costs, planning and various types of mechanical and non-mechanical plant. The lectures will be given by A. G. Stone.

'Ultimate Load Design for Reinforced and Prestressed Concrete' will be studied in six lectures on Tuesday evenings from November 7, to be given by L. L. Jones. The subjects will include the philosophy of ultimate load design, the assessment of load factors, ultimate strength of sections and load analysis. J. Hillier and J. M. Fisher are to give a course of lectures on 'Highway Engineering' commencing on November 9 on six Thursday evenings. It will include the assessment of present traffic conditions, accidents and the design and constructional aspects of the subject. A three-week course on Tuesday and Thursday evenings will be held from January 16 on 'Engineering Concretes.' The lecturer will be D. A. Stewart, who will cover the properties of concrete, including the static and dynamic moduli of elasticity, aggregates, plant, vibration and shuttering. The effects that modern techniques should have on structural designing and detailing will be considered and the course will be illustrated with slides, films and demonstrations. A course on 'An outline of Photogrammetry and its Application in particular to Civil Engineering' will be held on ten Thursday evenings from February 8 (fee £1 11s.) and will deal with the basic fundamentals and practical applications of the subject. A photogrammetry laboratory will be visited for a demonstration of plotting machines.

'The Linear Analysis of Cylindrical Shells' will be the subject of ten lectures (fee £1 1s.) on Friday evenings from February 9 to be given by J. Munro, which will include elementary matrix algebra, the geometry of some common shell surfaces and a direct solution of Jenkins equation. Four Tuesday evening lectures will be devoted to 'Foundation Engineering' commencing May 1 and will be given by S. Rosenak. W. M. Jenkins will give six lectures on Friday evenings from May 4 on 'Collapse Design of Steel Structures,' dealing with the advantages, limitations and methods of plastic design, and moments, forces, connections and deflections.

Houses in the Surrey Green Belt

Minister Allows Oxshott Brickworks Scheme

THE APPEAL of Oxshott Brickworks Ltd. for the filling of 15 acres of land, including the clay pit, and the building of houses following the clearance of existing buildings on adjacent land at the brickworks in Littleheath-lane, Oxshott, Surrey, has been allowed by the Minister of Housing and Local Government. Planning permission had been refused by Esher Council for the filling and the proposed building of 60 houses.

Announcing his decision, the Minister stated that there appeared to be no reason why the proposed filling operations should not be carried out satisfactorily but certain conditions had to be observed and application which might be made specifically for tipping household refuse would have to be carefully considered on its merits, having regard to the level of the water in the clay-pit and the availability of other sites and the need for depositing household refuse.

The Minister agreed with his inspector that conditions should be imposed regulating the hours and methods of filling, the cleansing of vehicles, means of access, and the final seeding with grass or rendering for cultivation. No materials other than earth spoil and inert builders' waste was to be deposited on the land and tipping had only to take place from Mondays to Fridays from 8 a.m. to 6 p.m. Public holidays were excluded.

The Minister decided to accept his inspector's report regarding the proposed development for housing purposes. Although the site was in the Green Belt, it was close to houses in Blundel-lane and Littleheath-lane and its development would have no adverse effect on the general character of the area which had an exceptionally large extent of open spaces. He thought that this particular piece of land could not make a sufficient contribution to the green belt, or to the preservation of the identities of Oxshott or Cobham to justify its retention as open space, and he considered that its loss from the green belt might be accepted.

Parts of the area comprised in the application were not physically suitable as they were and the number of houses, therefore, must be agreed with the Council as must their design and siting. Landscaping must also be properly carried out and agreed with the local authority.

Housing Development at Kirkby

A VISIT was made by Mr. Henry Brooke, Minister of Housing and Local Government, to Liverpool on September 15. The Minister opened the 10,000th dwelling built at Kirkby by the Unit Construction Co. Ltd. for the City since 1952.

The Institute of Clerks of Works

Examination Results, 1961

FROM THE RESULTS just announced of the Institute of Clerks of Works of Great Britain's 1961 examinations, it is evident that the Institute's recommendations to technical colleges for the theoretical training of clerks of works who intend to sit for the ICW examinations were very necessary. Lack of preparation and lack of knowledge by candidates are shown very markedly by the results. Of 53 candidates who sat for the full part 2 final examination, only eight passed in all groups.

The results of the examination, which was held simultaneously in London, Edinburgh, Manchester, Nairobi and, for the first time, in Hong Kong, were as follows:

PART I (PRELIMINARY).—London: E. G. Andrews, R. J. Baldock, E. J. Bush, B. K. Cook, J. R. Davis, *E. A. Evans, R. A. Hamilton, R. B. Hewitt, B. T. Latter, *R. McKernan, *R. A. Miller, E. Morris, B. F. Prichard, W. H. S. Rutledge, L. K. J. Scagell, F. R. Slattery, A. G. Warner, F. H. Webb, A. J. Wood.

Belfast: H. H. Boyd, T. Casson.

Edinburgh: W. F. Bald, M. A. Sabatini.

Manchester: W. Cavanagh, D. G. Cooper, A. R. Dodd, R. Emmison, W. J. Holland, B. Kirby, J. Maguire, W. Martindale, D. E. McKenzie, H. W. Morgan, J. Stenton, K. Womersley.

Hong Kong: *Lam Pak Hang.

The following passed the written examination in May, 1960, and have now passed the Materials Test, thus completing the examination: R. Dean, E. Rivers.

PART II (FINAL).—London: E. J. Drew, G. J. Turner, *R. E. Wadney.

Edinburgh: J. Graham, G. B. Robertson.

Manchester: G. Brooks, J. Saunders, W. Zachary.

The following passed in three groups in May, 1960 (or earlier), and this time completed the examination (with the exception of those marked with *): A. J. Barron, R. W. Brooker, *E. H. Gee, A. H. Jarvis, L. Richardson, S. Shrouder, A. Skinner, R. P. Talbot, D. H. Williamson.

The following passed in two groups in May, 1960 (or earlier), and this time completed the examination: B. Armstrong, A. Buchan, D. S. Chalmers, D. McCullough, J. A. Reeks.

The following passed in three groups out of four: C. Barnfield, J. Boocock, *J. Breedon, A. Brown, A. W. Cleugh, P. E. Figaro, R. W. Goad, W. R. Grout, *G. D. Hawkins, B. Heggarty, D. Hitchen, T. N. Hughes, R. F. Lynch, J. P. Mulligan, R. D. Osborne, *P. Pearson, J. Stevens, F. J. Thomson, C. Watts, R. A. Watts, C. K. Wong.

The following passed in two groups out of four: M. J. Charlton, K. H. Cheng, M. Donaldson, A. D. Gibson, F. E. Hearn, G. Hill, J. Seymour.

The following passed in two groups in May, 1960 (or earlier) and this time passed in one more group: J. Bilsborough, L. J. Charles.

The following passed in Materials and completed the Examination: K. J. Butterworth.

N.B.—Candidates whose names are marked with an asterisk are required to take a further materials examination.

Construction in Wood

American Architect to Lecture Here

FROM A CORRESPONDENT

DR. E. GEORGE STERN, research professor of wood construction at the Virginia Polytechnic Institute at Blacksbury, Virginia, is to lecture in England, Germany, Sweden and Finland on modern methods of wood construction. His visit to England has been for the first International Conference on Timber Engineering, being held at the University of Southampton from September 18 to 23.

An architect and engineer, Dr. Stern had a major part in the development of a new method of roof construction, fastened with a new type of nail. The roof, known as the 'trussed rafter roof,' can be supported by the exterior walls of the structure alone, without requiring additional strength in interior partitions. The nails for this construction are slender hardened steel spikes with a threaded end and a large head. The spike is so slender that it is not necessary to drill a hole first, and, Dr. Stern says, it makes the joint stronger than the wood itself. This method of construction uses less timber, reduces costs, and simplifies the whole building procedure. With it an entire house, from foundation to roof, can be built in one day.

Influence on Wood Imports

The development of the special roofing nail has also influenced English wood imports, according to Dr. Stern. Previously European Redwood had been imported for building, but with the introduction of the threaded spike, it was found that American red cedar was more suitable. Asked whether the modern American construction methods—using light materials such as gypsum board and plywood—produced strong permanent structures, Dr. Stern emphasised that such a building, properly built and maintained, would last as long as any other well-built house. Such buildings could be better insulated and had lower maintenance costs.

Glasgow's Industrial Estate

Use of Scottish Resources

'DIXON'S BLAZES' is to be retained as the name of a new industrial centre to be developed on the original site of that name in the Hutchesontown area of Glasgow, south of the river. Work on the site, which is being developed by Messrs. Taylor Woodrow Industrial Estates Ltd., began on September 13. Full use, it is stated, is to be made of Scottish resources —Scottish architects, Scottish building contractors and Scottish finance. Keen interest has already been shown by Glasgow Corporation and other authorities, and by many important business organisations.

The total area purchased by Taylor Woodrow from Colvilles Ltd. is 35.8 acres and it is intended to develop the site for the building of both small and large factories ranging from about 5,000 sq. ft. to 250,000 sq. ft. in area. The local planning authorities have welcomed the scheme because it is complementary to the Gorbals re-planning and housing project. The general plan of the layout of roads and services has been approved by the corporation.

The consulting architects acting for Taylor Woodrow in the layout of the estate are Messrs. Keppie Henderson & Partners, of Glasgow, who have prepared a site plan and will be concerned in the design of the factories. Taylor Woodrow engineers are carrying out the engineering design and soil research for roads, services and layout problems. The work begun on September 13 consists of preliminary levelling and preparations for the construction of roads and services and it is hoped that factory building will start before the end of the year.

Inquiries for buying sites and buildings have been received from a number of firms, including Messrs. Thomson and Brown Brothers Ltd. and Messrs. Monks and Crane Ltd. Contractors at present working on the site are Messrs. J. Smart (Contractors) Ltd.

Cast Stone Industry

The Industrial Court's 'Damaging Award'

THE BULLETIN for August 23 of the British Employers' Confederation makes reference to the damage which may be caused to employers by the Industrial Court making a retrospective award, is demonstrated by a decision affecting the cast stone and cast concrete products industry.

In that industry the unions applied for a general increase in wages of 3d. per hour and the case, which was referred to the Industrial Court, came up for hearing on June 1. The court's award was not published until July 3, its decision being:—

> '. . . that the minimum rates of wages of the adult male workers concerned shall be increased by 3½d. per hour with effect from the first full pay week commencing after April 1, 1961, with proportionate increases for women and juveniles'.

Neither the employers nor the trade unions, in their written or oral statements, invited the court to make its award retrospective.

It is a feature of this industry (states the Confederation) that many producers work to fixed price contracts. Between June 1 and July 3 a number of new contracts were negotiated, and the result of the award is that the cost of the increase in pay, which amounts with overtime to over 15s. per week per man, will fall entirely on the employers in respect of these contracts.

If fixed prices are to be negotiated on a realistic basis it is manifestly unreasonable that wages should be permitted substantially to increase with retrospective effect during the performance of these contracts. In the quarrying industry, for example, prices under the Agricultural Lime Scheme are fixed by the Ministry of Agriculture and form part of the basis of the guarantee given to farmers. These cannot be altered retrospectively.

The Confederation concludes: 'If further cases concerning fixed price contracts come before the Industrial Court it behoves employers to point out the injustice of making an award retrospective.'

A Standard Form of Estimate

New NFBTE Publication

THE NFBTE, at the request of the Smaller Firms Committee, has prepared a standard form of estimate for use, as appropriate, in the execution of small works. The form (a facsimile of which is reproduced by courtesy of 'The National Builder') is of foolscap size and in duplicate, space being left for the inclusion of the name of the member firm. Prices for numbers are obtainable from the Federation at 82 New Cavendish-street, W1.

CONDITIONS OF ESTIMATE

1. Except as expressly agreed, the Builder shall provide all labour, materials and equipment necessary for the proper execution of the work. Every care will be taken in the use and fixing of materials or goods (if any) to be supplied by the customer but no responsibility for their suitability or for damage caused to them during fixing is accepted.

2. Sound materials suitable for their respective purposes will be used, but are supplied subject to any conditions of sale attached thereto by the manufacturer or supplier. In the event of any materials proving faulty the Builder's liability for making good is limited to such amount as may be recovered from the manufacturer or supplier.

3. The words "prime cost" or "p.c." where used in the estimate or specification indicate the net amount proposed to be paid by the Builder to a merchant or manufacturer for the supply and/or fixing of the item concerned together with such cash discount not exceeding 5 per cent. as the Builder shall obtain. Should the net amounts in fact payable by the Builder in respect of prime cost or p.c. items together with such cash discounts prove to be higher or lower than the prime cost or p.c. amounts then the difference shall be added to or deducted from the quoted price.

4. The words "Provisional sum" where used in the estimate or specification indicate the amount included therein to cover a specific item of work and the estimate is subject to adjustment by substituting for the provisional sum, where the item of work is carried out by a sub-contractor, the amount payable to such sub-contractor plus a supervisory charge not exceeding 5 per cent. or where the item of work is carried out by the Builder a price agreed therefor or in accordance with the National Schedules of Daywork Charges.

5. The value of any variations to the work included in the estimate ordered and authorised by the customer, whether by addition, omission or substitution of any work, should wherever practicable be agreed before the variation is carried out. The value of all variations shall be added to or deducted from the price stated in the estimate.

6. Defects which exist at or may appear within three months from the completion of the works if proved to arise from workmanship or materials not in accordance with the estimate will be made good by the Builder at his own cost. Notice in writing of such defects must be given to the Builder before the expiry of the period stated.

7. Irrespective of any insurances taken out by the Builder the customer should advise his insurers that building works are being carried out on his property and satisfy himself that he is adequately covered by insurance against loss or damage by fire or other risks arising out of and during the progress of the building operations. Unless otherwise expressly agreed the Builder is not liable for loss or damage by fire to the works, materials on site or any property of the customer.

8. The date agreed for completion is subject to alteration in the event of delays occurring through inclement weather, strikes or lockouts affecting the Building Trade, additions or variations to the works described in the estimate or any causes beyond the Builder's control.

9. Payment shall become due forthwith upon the submission by the Builder of a final account, following the completion of the works. Where the period for completion of the works exceeds one month, arrangements shall be made for interim or stage payments.

10. This estimate is subject to confirmation if not accepted and possession of the site given within two months.

11. Any dispute or difference arising out of the execution of the work is to be referred upon the application of either party to a person to be nominated by the President of the Institute of Arbitrators, whose decision shall be final and binding on the parties.

SPECIAL CONDITIONS (if any)

To: REF.:

Dated ..... 19.....

Dear Sir/Madam,

We offer to carry out in a good and workmanlike manner the work described in the Estimate below dated ..... 19..... (and in any drawings and specification annexed hereto) for the price of £....., subject to the Conditions set out overleaf, to which attention is called.

Yours faithfully,

ESTIMATE

Firm Prices in the Common Market

Manufacturers' Present Attitude Criticised

THE ATTITUDE of British manufacturers and merchants over the question of firm prices for the longer contract periods was criticised in the light of possible competition from the Common Market by Mr. W. Leake, FIOB, president of the Midland Federation of Building Trades Employers, speaking at Derby on September 15. In his address to the half-yearly general meeting of the Derby and District Association of Building Trades Employers MR. LEAKE pointed out that foreign competitors were more inclined to quote firm prices for a contract period approaching two years than our own manufacturers and merchants. When we eventually entered the Common Market, he continued, and tariffs were reduced, contractors would inevitably give more than a cursory glance to the terms of suppliers of the member nations so long as manufacturers in this country maintained their present attitude.

'Not only does the failure of suppliers to price for two years mean they are not contributing towards a stable economy,' Mr. Leake went on, 'it means also that they lack confidence in themselves as businessmen. Manufacturers who cannot make a sound appraisal of trends in their own raw materials market and judge their other costs, are to my way of thinking incompetent. Confronted, such firms will advance reasons why they cannot, but if we as contractors can tell clients that a building will be erected in 24 months and quote a price of £X then surely suppliers can do the same.'

Both contractors, and architects when nominating, concluded the speaker, should ensure that they dealt with sound businessmen. There were in most cases alternative sources of supply and these would increase when we belonged to the Common Market.

Hockey

Chartered Surveyors' Fixtures

THE HOCKEY SECTION of the Chartered Surveyors' Sports Club will be playing the Law Society on November 1, the Chartered Accountants on December 13, The College of Estate Management on January 24, and the Chartered Auctioneers and Estate Agents Institute on March 7. Members of the Royal Institution of Chartered Surveyors who wish to join the hockey section of the sports club should get in touch with Mr. E. L. Norman, 6 The Broadway, Muswell Hill, London, N10 (tel.: Tudor 0123).

Buildings for Fodder Storage

THE AGRICULTURAL RESEARCH COUNCIL has published the sixth section of its first bibliography on farm buildings, entitled 'Buildings for the Processing and Storage of Fodder.' It gives references to many matters affecting the design, construction, economics and use of farm buildings. It is available from the ARC Farm Buildings Unit, Wrest-park-lodge, Silsoe, Bedfordshire, price 4s. or 4s. 6d. by post.

Heating, Ventilating and Air Conditioning

Exhibition at Olympia

THE HEVAC exhibition, which opens at Olympia, September 26, is the first international heating, ventilating and air conditioning exhibition to be held in Europe. Because of the higher standards now expected both in the home and at work, rapid advances have been made in this field over the past few years and the exhibition gives ample evidence of an expanding industry.

One of the widest ranges of appliances is being offered by AGA HEATING, a division of ALLIED IRONFOUNDERS LTD. They are exhibiting seven domestic boilers, a warm air heater, two industrial boilers and an automatic stoker. The 8¼-ton 'Kayenco' industrial boiler overshadows the Aga stand. This is a shell type boiler for steam raising purposes, automatic in operation and supplied in fully packaged form. It has a rating of 4,000 lb. of steam per hour at a working pressure of 100 lb. psi.

COPPERAD LTD. are including two new products in their display: an improved type of Sill-line heating equipment, specially designed, as the name implies, to be installed as a continuous run beneath the window-sills, and a newly designed fan convector. This is very narrow in style with a depth of only 8⅞ in., and is suitable for domestic as well as commercial and educational installations. The convector incorporates a new three-speed motor. The normal and low speeds have now been supplemented by a very fast speed for rapid heating. The other new feature of the convector is that it provides all-round air diffusion. By means of a rotatable 'Copperad' grille, the air volume can be diffused in each or any one of four directions.

Electrical Heating

Equipment and pictorial features on the stand of the ELECTRICAL DEVELOPMENT ASSOCIATION show how the latest developments in electric heating and air-conditioning techniques make for easier installation and greater economy in operation. There are five air-conditioning units on view, together with thermal storage heaters and electric under-floor heating systems. Electricity's plan for whole house heating is featured, and eight different methods of electrical heating shown—all made economically attractive by the use of controls.

HARFORD PUMPS LTD. are showing their range of pumps, valves and other equipment for use in central heating systems. Among the principal items are four HCP models of 'Opio' glandless circulating pumps which cover all the requirements of the small bore market, and twin-action radiator valves. Here, the twin action design combines the duties of a normal radiator valve and a lockshield valve. This makes it unnecessary to fit two valves per radiator and has the additional advantage of taking all guess work out of the balancing of a system. It is also possible to replace the gland without draining down.

From their Foam Plastics division, NEWALLS INSULATION CO. LTD. are showing a range of rigid polyurethane pipe sections and slabs. Developments in this field have produced the self-extinguishing rigid polyurethane materials having a very low thermal conductivity of 0.15 Btu in/ft² h deg. F., suitable for all types of low temperature application. In addition to producing rigid forms, Newalls are engaged on contracts using polyurethanes which may be foam dispensed or poured as a liquid mix into cavities of complex design or difficult of access.

Continuous-Weld Tubes

Exhibits on STEWARTS AND LLOYDS' stand demonstrate the diversity of the company's products. Among items on display are samples of continuous weld tubes to BS 1387, used extensively in heating and ventilating installations, 'Belmont' gunmetal and brass valves and fittings, and butt-welding fittings. Also exhibited are samples of rectangular hollow sections for structural purposes. The Pipework Engineering division of Stewarts and Lloyds, which undertakes the manipulation of a wide variety of pipework, is displaying photographs of under-floor heating panels of its manufacture.

An interesting new exhibit of UNI-TUBES LTD. is a lead lined flexible tube used as a flue lining where heating is by gas-fired appliances. It is found that modern appliances have become so efficient that the heat discharged into the flue is not sufficient to raise the temperature of the brickwork above condensation point. The 'Kopex' tube makes sure that the flue gases never come into contact with the brickwork and so avoids the erosive effects of condensation. In addition to this protection, the tube improves draught conditions and enables higher flue temperatures to be achieved by the formation of a static air gap around the outside of the tube. This minimises heat losses to the brickwork.

A special feature of the stand of YORKSHIRE IMPERIAL METALS LTD. is a working exhibit of a small bore forced-circulation central heating system, which demonstrates the application of the company's copper tubes and capillary fittings to this type of system, with piping arrangements from the main heating unit, through the circulating pump and to five different kinds of radiators.

The exhibition is open daily from 10 a.m. to 6 p.m., with extended opening hours to 9 p.m. on September 28 and October 4. It closes at 4 p.m. on Friday, October 6.

Demolition Contractors

Proposed Three-Year Apprenticeship

AN APPRENTICESHIP SCHEME is to be launched by the National Federation of Demolition Contractors to mark its coming of age. The aim is to create a much-needed nucleus of skilled labour and to give improvers a status and greater incentive. At the Federation's annual conference at Llandudno it was pointed out that qualified demolition contractors first came into their own following wartime bomb damage. They were now coming into their own again as a result of efforts of town and country planners to concentrate new building developments on the sites of existing old buildings as a means of preserving green belts outside the boundaries of cities and towns.

The president, MR. S. B. ALLISON, of Glasgow, pointed out that the workers had to have a knowledge of valuable materials as well as an aptitude for heights. Later, at the annual dinner, Mr. Allison criticised local authorities who, when the Chancellor of the Exchequer called for a curb on extravagance, bought waste products from the mines and steel furnaces for roadmaking when there was ample material available at the demolition sites. Turning to the apprenticeship scheme, the speaker said that young men would be encouraged to undertake the proposed three years of practical training. This training would be simpler than many apprenticeship schemes already operating, and, in many cases, more rewarding.

DR. T. P. HUGHES has been appointed assistant managing director of B.B. Chemical Co. Ltd. of Leicester.

Tea Break Dispute

Developments in Leicester

STRIKE ACTION might follow if building employers maintained their stand on tea-breaks, said MR. A. E. HALL, secretary of the Leicester branch of the National Federation of Building Trades' Operatives, at an emergency meeting in Leicester on September 14. The employers have said that the breaks should not count as paid time.

Mr. Hall said that employers in Leicester had put leaflets in the pay packets of operatives and the wording 'could lead them to believe they were compelled to agree.' The leaflets said that teabreaks had never been allowed for in the working rule agreement, which recognised only the dinner interval. Mr. Hall said that members of building trade unions in Leicestershire were being instructed not to come to terms with their employers in agreeing to unpaid tea breaks. Where attempts were made to impose the condition, strike action would be considered.

Direct Labour Rejected

DURHAM COUNTY education committee has rejected a motion for the setting up of a direct labour organisation to carry out alterations and adaptations to schools. It was pointed out that the capital expenditure for the new department would be very great, while wages and administrative costs would also be high. It was decided that the system would slow up the carrying out of minor repairs at schools, at present done by local tradesmen. It was also stated that it would be difficult to recruit the necessary staff.

Co-ordination by Design-Modules

Satisfying Essential Requirements of Selectivity and Additivity

BY J. W. HARDING, M.SC, PH.D

To secure the co-ordination of building dimensions it is not sufficient to stipulate that component and design dimensions shall be multiples of a module. In practice it is necessary to limit the range of sizes for each type of product, as a result of which there is no guarantee that a limited selection of component sizes can be fitted into a preselected modular interval. This problem becomes most acute when the selection is small and the sizes are large.

These facts emphasise the necessity of establishing a systematic relationship between component and design dimensions which will serve both as a guide in the selection of a range of component sizes for a variety of products and as an aid to the architect in determining the various ways in which a selected design dimension can be built up from combinations of component dimensions.

The object of this paper (Note No. E1134, published by permission of the Director of Building Research and Crown Copyright reserved) is to provide a theoretical basis for the choice of a set of dimensions which incorporates the essential requirements of selectivity and additivity while maintaining that degree of flexibility which is necessary to accommodate the various factors, economic, technical and architectural, which must determine the final form of the selection. The method is perfectly general in its applicability and can be used in conjunction wth any choice of module or modules.

1. Introduction

In an earlier paper* attention was drawn to the importance for modular co-ordination of dimensions formed from combinations of two appropriately chosen modular dimensions. While a number of writers have adopted the number theorem used in this connection (Appendix) as a useful tool in conjunction with other schemes of co-ordination it appears not to have been realised that the method is a self-contained system of co-ordination. The object of the present paper is to develop the method more explicitly from this point of view.

The co-ordination of dimensions on a modular grid poses two complementary problems: the derivation of a range of component sizes for a variety of products and the provision of information to the architect regarding the various ways in which a selected design dimension can be built up from a combination of component dimensions.

Expressed in terms of components the problem is hardly amenable to direct attack because of the large variety of component sizes which can be envisaged, even if we confine ourselves to the modular grid and omit temporarily all consideration of sub-modular dimensions. The problem can, however, be greatly simplified by setting it in another way. We first see how a range of design dimensions can be built up from combinations of units of design. These units of design are then interpreted in terms of component sizes, which yields a solution of the original problem.

Since the use of planning grids in the design of many systems of prefabricated construction has been based on dimensions of 32 in. or 40 in., thus implying a primary module of 4 in., this module will be used for illustrative purposes. Moreover, the use of the same module in the horizontal plane and in the vertical direction will free the exposition from purely numerical complications which contribute nothing to the main argument. The system is, however, quite general in its applicability and any other modules, such as 3 in. or 4½ in., can be used in connection with it. The final choice of the dimensions which define the system, that is, the module or modules and the larger units of design, the design-modules, is empirical and depends on the complex interplay of architectural, technical and economic factors. What is being offered here is a theoretical background for the choice of a set of dimensions which provides the essential requirements for any system of dimensional co-ordination—selection and additivity.

2. Selection by Design-Modules

In the Bemis approach to modular co-ordination the choice of component and design dimensions is restricted to multiples of a module, to multiples of 4 in. in the case which we are considering here. No positive guidance, however, is given on the selection of component sizes, except that they should be multiples of 4 in., nor is there any indication as to how components can be systematically assembled in design. This is not what we understand by co-ordination. The acceptance of a set of dimensions containing all multiples of a module, which may be described briefly as a Bemis set, is in fact only the first step towards a solution of the problem of co-ordination. This involves two complementary and inseparable problems; the selection of component sizes for the purpose of standardisation and guidance upon their assembly in design.

The ideas which lie behind the use of a planning grid, one of mesh 36 in. say, provide a valuable clue as to how the problem may be tackled. This grid performs two important functions. In the first place it introduces into the problem a measure of the human scale. In the second place, by diverting attention from the great diversity of component sizes and focusing it upon a simple unit of design which can later be interpreted in terms of component sizes, it considerably simplifies the problem by allowing it to be tackled in stages.

On the one hand there are the dimensions of the modular grid:

$$p \times 4 \text{ in.}, \quad (E)$$

while on the other hand there are the dimensions of the planning grid:

$$p \times 36 \text{ in.}, \quad (A)$$

where the coefficient p in both cases may have any positive integral value including zero. The set E possesses 4 in. flexibility without any selectivity beyond that imposed by the grid mesh, while the set A provides a very rigid selection of dimensions on the modular grid and takes no account of modular increments, that is, it possesses no modular flexibility.

A bridge between these two extreme situations can be provided by a set of dimensions formed by adding multiples of 36 in. to multiples of another large modular dimension, say 64 in. = 32 in. + 32 in. With the use of a convenient shorthand any dimension in this set can be written in the form (p, q) where the bracket/symbol (p,q) is defined by:

$$(p, q) = p \times 36 \text{ in.} + q \times 64 \text{ in.} \quad (B)$$

The complete set is obtained by allowing the coefficients p and q to have any positive integral value including zero. In this notation the dimension p × 36 in. of the planning grid is simply (p, o). What has been done is to replace the single unit of design, 36 in., of the planning grid by two modular units of design, 36 in. and 64 in., which we shall call DESIGN-MODULES. The set (p, q) provides the dimensions for a modular planning grid. At this stage the reason for the introduction of 64 in. rather than some other dimension may appear to be rather oblique. Pending the development of the consequences of this choice it can perhaps be made intuitively acceptable if we say that 36 in. represents a one-person unit, or a single door width, and that 64 in.=32 in.+32 in. or 28 in.+36 in. represents a two-person unit, or a double door width.

The process of adding modular dimensions to the planning grid, started by the introduction of the set (p, q), can be continued. To do this we retain the smaller design-module 36 in. and express the larger design-module 64 in. in terms of a new design-module, 32 in., which leads us to consider the new set (p, q)′:

$$(p, q)' = p \times 32 \text{ in.} + q \times 36 \text{ in.} \quad (C)$$

The set (p, q)′ contains the set (p, q) and some additional dimensions which are not contained in the set (p, q). If the set (p, q)′ contains the set (p, q), the reader may ask, why bother about the set (p, q) at all? The reason is that we are trying

* Harding, J. W. and Vallance, L. S. Geometrical Aspects of Modular Co-ordination. 'The Builder' 1957, Vol. 193 (5974), September 27, pp. 552-555.

to classify the dimensions of the Bemis set (i.e. every 4 in. multiple) into a number of sub-sets† based upon the largest design-modules consistent with the maintenance between the different pairs of design-modules of simple relationships which will ensure the co-ordination of the various sub-sets within the Bemis set. The number theorem (Appendix) tells us that combinations of 32 in. and 36 in. will reproduce all multiples of 4 in. from 18 ft. 8 in. upwards as well as 27 dimensions below 18 ft. 8 in. This means that we have already accounted for all but 28 of these 4 in. multiples below 18 ft. 8 in.

We continue the process by a further break-down into smaller design-modules. We can express 32 in. as the sum of 12 in. and 20 in. and get a new set (p, q)″:

$$(p, q)'' = p \times 12 \text{ in.} + q \times 20 \text{ in.} \quad (D)$$

We could break down 32 in. (or 36 in.) in other ways, but there are advantages in the way selected, as will appear later. The number theorem tells us that combinations of 12 in. and 20 in. will reproduce all 4 in. multiples from 32 in. upwards, and 3 dimensions below 32 in. These three dimensions are 12 in., 20 in. and 24 in. With the introduction of this last sub-set (p, q)″ we have now accounted for all the 4 in. multiples with the exception of the four dimensions 4 in., 8 in., 16 in. and 28 in. If we add these missing dimensions then we arrive at the Bemis set (p):

$$(p) = p \times 4 \text{ in.}, \quad (E)$$

which represents the last stage in the steady progression from selectivity without modular flexibility, as represented by the planning grid (A), to modular flexibility without selectivity, as represented by the modular grid (E). Between these two extremes we seek the answers to our problems. Each set in the sequence (p), (p, q)″, (p, q)′, (p, q), (p, o) contains the sets which follow it, that is, the selectivity of the set increases as we move from left to right, from (p) to (p, o). If a dimension is contained in more than one set it is assigned, for purpose of classification (see Table p. 548), to the set based on the largest pair of design-modules. The classification of the Bemis set (p) represented by the three sub-sets (p, q), (p, q)′ and (p, q)″, together with the four dimensions 4 in., 8 in., 16 in., and 28 in. left in the set (p), forms the basis of the DESIGN-MODULE TECHNIQUE (D.M.T.).

The Bemis Set In Numerical Detail

Having described the classification of the Bemis set in general terms we now follow it through in numerical detail. This can be done very simply by treating the Bemis set (p) as a number of groups of dimensions each headed by a multiple of 3 ft.: the 3 ft. group, the 6 ft. group, the 9 ft. group, and so on, where each group runs from a multiple of 3 ft. at its top to a dimension which exceeds by 4 in. the next lowest multiple of 3 ft. at its bottom. The dimensions in each group are then classified separately. The method is to start with a multiple of 3 ft. and convert a unit of 36 in. into a unit of 32 in. This operation decreases the original dimension by one module and we record both the new dimension and the new bracket symbol which arises from the operation. In the 9 ft. group, for example, 9 ft.=(0, 3)′ becomes 8 ft. 8 in. which is recorded with its new bracket symbol (1, 2)′. This process is repeated until all units of 3 ft. are exhausted. We arrive at 8 ft. 4 in.=(2, 1)′ and then at 8 ft.=(3, 0)′. We have then obtained all the dimensions of the set (p, q)′ which belong to that group because we have converted all the available units of 36 in. into units of 32 in. To make further progress we express the last dimension in terms of the next pair of design-modules, 12 in./20 in., i.e. we express 8 ft. as (8, 0)″. By converting 2 units of 12 in., into 1 unit of 20 in. we reduce the dimension by one module. This process is repeated until we reach the end of the group. We have then obtained all dimensions of the set (p, q)″ which belong to that group. In carrying out this last stage it should be noted that units which pile up in the second place of the symbol may be thrown back into the first place of the symbol by the use of the relation (0, 3)″=(5, 0)″.

Identifying Dimensions in Each Group

It remains to identify the dimensions in each group which belong to the set (p, q) as well as to the set (p, q)′. This is done by picking out those dimensions of the set (p, q)′ in which p is an even number (=2 P, say) or zero because a dimension of the form (2 P, q)′ =2 P × 32 in. + q × 36 in. can clearly be rewritten in the form q×36 in.+P×64 in. =(q, P). In the 9 ft. group, for example, the dimensions which belong to the set (p, q) are 9 ft.=(0, 3)′=(3, 0) and 8 ft. 4 in.= (2, 1)′=(1, 1). In dealing with dimensions from 24 ft. upwards it is important to remember that 9 ×32 in.= 8×36 in., i.e. (9, 0)′=(0, 8)′.

We can now tabulate the dimensions in the 9 ft. group. It will be noted how much the use of the symbols facilitates the computations:

ft.	in.
9	0=(0,3)′=(3,0)
8	8=(1,2)′
8	4=(2,1)′=(1,1)
8	0=(3,0)′=(8,0)″
7	8=(6,1)″
7	4=(4,2)″
7	0=(2,3)″
6	8=(0,4)″=(5,1)″
6	4=(3,2)″

This machinery will deal with every group except the 3 ft. group which has already been accounted for. The classification of the dimensions of the Bemis set, i.e. the 4 in. multiples, in the range 0 ft.-30 ft. is given in the Table which may be extended at will in the manner described. Where a dimension belongs to more than one set it is assigned to the set based on the largest pair of design-modules. It is important to note that every dimension from 6 ft. 8 in. upwards can be expressed as a combination of 20 in. and 24 in. Where there are alterative ways of representing a dimension in the set (p,q)″, as in 7ft.=(7,0)″=(2,3)″, we have tabulated the form which removes the odd unit of 12 in.

3. Use in Standardisation and Design

The design-modules 32 in. and 36 in. play a central role in the theory and to a large extent determine the pattern of its development. This is because the larger design-modules are formed from combinations of 32 in. and 36 in. and because there are only a few ways of breaking down the basic pair 32 in./36 in. into smaller design-modules of which one pair, 12 in./20 in., appears to be of special value. The principle of identifying each of the basic design-modules, 32 in./36 in., with the width of a door frame as a significant measure of the human scale has been used to select from all the possible mathematical systems, i.e. all systems based on an arbitrary choice of design-modules, one which is likely to be reasonably well adapted to describe the geometrical relationships in a building intended for human habitation. Nevertheless the selection of component and design dimensions is a complex operation and involves many factors, architectural, technological and economic.

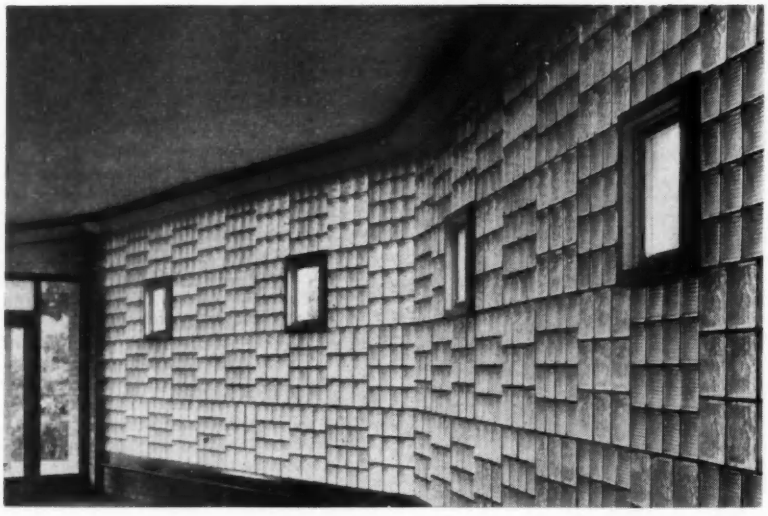
It would therefore be surprising if there were no conflict between what would appear to be the optimum solution from the point of view of a simple theory—and it is highly desirable that the simplicity of the theory should be maintained—and what would appear to be the optimum solution when all the relevant factors have been taken into account. The design-module technique has been devised to meet this situation. It does not say that the range of component sizes must be this or that: it merely says that the geometrical relationships are simpler and the aims of modular co-ordination are most effectively promoted if, having taken all the relevant factors into account, it proves to be possible to give preference, in general, to those dimensions which are based upon the largest units of design, that is, the largest design-modules.

More explicitly, first preference is given to the set (p,q), second preference to the set (p,q)′ and so on. The large unit of design has more design potential in the sense that it may be interpreted, if need be, in terms of a large unit of construction as well as in terms of a variety of smaller sizes. The disadvantage of thinking all the time in terms of a small unit of design, such as the module, is that one tends to take what can easily be got without stopping to think whether the variety is really necessary.

An Acceptable Discipline

D.M.T. then does not consist of a set of rigid rules. It is a discipline which can be accepted in judicious amounts. A glance at the Table, coupled with the knowledge that the theory can readily be extended to include dimensions on a sub-modular grid, should indicate its flexibility. All that we are stressing is the otherwise obvious fact that some ways of using dimensions on a modular grid

† A subset is a selection of dimensions from a larger set.



GLASS WALL IN CHURCH.—*A 40 ft. wall of 3¾ in. thick glass blocks, 8ft. high which runs the length of the foyer of the First Church of Christ, Scientist, Hendon. The glass blocks, nearly 1,000 of them, were made in two sizes—6 in. x 6 in. x 3¾ in. and 8 in. x 8 in. x 3¾ in.—by Pilkington Bros. Ltd., and contain a cavity to reduce external sound. The architect was G. B. A. Williams, FRIBA, and the main contractors, C. P. Roberts & Co. Ltd. The glaziers were J. Pearson & Sons (London) Ltd.*

are better than others. If we take too much advantage of the freedom which the system affords we shall merely discover that we are on our way back to traditional practice. With these general remarks we now turn to a few examples which will illustrate the application of the method.

Some Practical Examples

Joists. On purely theoretical grounds we are led to give first preference in the range 6 ft.-15 ft. to the 9 lengths (clear-span): 6 ft.=(2,0), 8 ft. 4 in.=(1,1), 9 ft. =(3,0), 10 ft. 8 in.=(0,2), 11 ft. 4 in. =(2,1), 12 ft.=(4,0), 13 ft. 8 in.=(1,2), 14 ft. 4 in.=(3,1) and 15 ft.=(5,0). Alternative sizes may be chosen from the set of second preference (p,q)′ or from the set of third preference (p,q)″ (see Table). Bearings must be added to these clear-span lengths to get the actual length.

On architectural grounds it may, for example, be decided to select clear-span joist lengths at foot intervals. For the sake of illustration let us suppose that this is the case:—

ft.	Combination
6	(2,0) =(0,2)′= (6,0)″= (1,3)″
7	(2,3)″=(7,0)″
8	(3,0)′=(3,3)″= (8,0)″
9	(3,0) =(0,3)′= (9,0)″ = (4,3)″
10	(0,6)″=(5,3)″= (10,0)″
11	(3,1)′=(6,3)″= (11,0)″= (1,6)″
12	(4,0) =(0,4)′= (12,0)″= (7,3)″=(2,6)″
13	(8,3)″=(3,6)″= (13,0)″
14	(3,2)′=(9,3)″= (4,6)″ =(14,0)″
15	(5,0) =(0,5)′= (15,0)″=(10,3)″=(5,6)″= (0,9)″

The combinations provide guidance upon the variety of ways in which these spans can be filled by a collection of components. All these spans may, of course, be regarded as combinations of 3 ft.= (1,0) and 4 ft.=(4,0)″.

Panel widths. The basic panel widths are simply the design-modules: 64 in.= (0,1), 36 in.=(1,0), 32 in.=(1,0)′, 20 in. =(0,1)″ and 12 in.=(1,0)″ which may be supplemented by some combinations of the smaller design-modules, such as 24 in.=(2,0)″, 40 in.=(0,2)″ and 48 in.=(4,0)″, in order to reduce the number of occasions upon which panels of small width have to be used.

Door frame widths. To be chosen from the Table to meet architectural requirements, say 28 in.=(7), 32 in.=(1,0)′, 36 in.=(1,0), 40 in.=(0,2)″, 52 in.=(1,2)″ and 88 in. (garage)=(4,2)″.

Window widths (in the range 0 ft.-9 ft.). To be chosen from the following first preference dimensions: 36 in.=(1,0), 5 ft. 4 in.=(0,1), 6 ft.=(2,0), 8 ft. 4 in.= (1,1), 9 ft.=(3,0), supplemented by a selection from the following, say 20 in.=(0,1)″, 24 in.=(2,0)″, 32 in.=(1,0)′, and 48 in. =(4,0)″ to meet architectural requirements.

The thickness problem. The solution of this problem, which is a central one in modular co-ordination, may be illustrated by investigating the overall span formed by two joist sizes (clear-span) meeting at an internal load-bearing partition of width 4 in.

If, for example, the clear-span joist sizes are 9 ft. and 12 ft., the overall span is 21 ft. 4 in., allowing for a 4 in. partition. From the Table, or by manipulating the bracket symbols, we find that 21 ft. 4 in. =(0,4), that is, the span is a dimension of first preference and can be filled by 4 units of 64 in. The point to note is that the overall span can be expressed in terms of large units of design, and hence interpreted in terms of large units of construction, in spite of the intrusion of a thickness of one module.

If we now add the thickness of two external walls, the overall span for a pair of 12 in. walls is 23 ft. 4 in.=(6,1), a dimension of first preference which can be spanned by 6 units of 36 in. and 1 unit of 64 in. When walls occur in pairs we can accept 2 in. increments in thickness without much inconvenience. The overall span for a pair of 10 in. walls is 23 ft.=(3,5)′ and for a pair of 8 in. walls it is 22 ft. 8 in.=(4,2).

All these dimensions can be interpreted in a variety of ways in terms of units of construction simply by changing the design-modules. For example, 22 ft. 8 in. =(4,2)=(4,4)′=(16,4)″=(21,1)″ = (11,7)″ =(6,10)″=(1,13)″.

Floor-to-floor height. As a repetition unit in the vertical direction this is an important dimension. For the ordinary dwelling we look to the 9 ft. group to provide this dimension, and from the Table we see that we have four dimensions in the first and second preference sets. If, for example, we select the first preference dimension 9 ft.=(3,0) and adopt an overall floor thickness of 8 in. we are led to a floor-to-floor ceiling height of 8 ft. 4 in. =(1,1), another first preference dimension which can be interpreted in terms of quite large units of construction. If, on the other hand, we select the first preference dimension 8 ft. 4 in.=(1,1) the floor-to-ceiling height becomes 7 ft. 8 in. =(6,1)″, that is, we are forced to introduce smaller units of design. The latter dimension may be interpreted as 3 units of 24 in. and 1 unit of 20 in. or as 2 units of 36 in. and 1 unit of 20 in.

Window heights. The discipline involved in D.M.T. is illustrated quite well by the derivation of a range of window heights for the ordinary dwelling. If, for example, we select 8 ft. 4 in.= (1,1) for the floor-to-floor height the bracket symbol immediately suggests that we should start by adopting the dimension of first preference 3 ft.=(1,0) as a floor-to-cill height. This choice leaves 5 ft. 4 in.=(0,1) to accommodate a window height and the depth of a lintel. If, as a matter of discipline, we restrict the choice of lintel depth to the size of one of the design-modules 12 in. or 20 in. we are immediately led to two window heights, 4 ft. 4 in.=(1,2)″ and 3 ft. 8 in. =(2,1)″. Assuming an overall floor depth of 8 in. the first choice of lintel depth brings the top of the window to 4 in. below the ceiling and the second brings the top of the window to 12 in. below the ceiling. The analysis is then repeated for other floor-to-floor heights and other floor-to-cill heights, etc., in order of preference. It is for a committee on standards to decide how much variation must be provided for here.

It is hoped that these few examples will suffice to illustrate the procedure.

4. Dimensions on a Sub-Modular Grid

The introduction of sets of dimensions on one or more sub-modular grids involves no new principles and we do not wish to lengthen this paper by pursuing this question here in detail. As a simple example, the design-modules 32 in. and 36 in. may be broken down into the design-modules 16 in. and 18 in. with the sub-module 2 in. as the highest common factor. Combinations of the pair 16 in./

18 in. therefore reproduce the same set of dimensions as combinations of the pair 32 in./36 in. together with some additional dimensions which lie on a 2 in. sub-modular grid. For example, 11 ft. 4 in. $=(2,1)=(2,2)'=4\times16$ in. $+4\times18$ in. By changing a unit of 16 in. into a unit of 18 in. we find 11 ft. 6 in. $=3\times16$ in. $+5\times18$ in., and so on.

5. Discussion

The method employed in section 2 of developing a classification of the dimensions of the Bemis set as a generalisation of the planning grid leads to the desired results quickly and simply. The intuitive nature of this treatment may, however, suggest that the solution proposed is of an ' ad hoc ' character. This is not the case. There are in fact deeper reasons for the adoption of this particular form of solution which suggest that there is less liberty of choice concerning the basis of the system than might otherwise be supposed. This is an important point because it is obviously desirable that standards should be based upon a solution possessing characteristics of permanence and stability and not upon an ' ad hoc ' solution which might be replaced tomorrow by another, possibly better, ' ad hoc ' solution. We therefore examine the solution proposed here from this point of view.

The solution of the problem of co-ordination hinges upon a realisation of the fact that there is no fundamental difference between a component dimension and a design dimension formed from a combination of component dimensions. For example, the dimension corresponding to a clear-span joist length is a component dimension if we are thinking of the joist: it is a design dimension if we are thinking of a collection of components which will span the same interval. This means that both types of dimension must be accorded the same status and selected from the same set of dimensions. Since the design dimensions are combinations of component dimensions the set of dimensions employed must be such that all combinations of dimensions in the set must also be contained in the set. In other words this set of dimensions must be what is known to mathematicians as an additive set.

Most General Type

The most general type of additive set is obtained by taking all possible combinations of an arbitrary number of modular dimensions which, for convenience, we have called design-modules. That such a set does indeed constitute an additive set is clear from the fact that all combinations of dimensions in this set are in turn combinations of the design-modules and are therefore, by definition, dimensions in the set. The Bemis set (p) and the planning grid (p, o) are special cases of this general solution when the number of design-modules is reduced to one, of size 4 in. and 3 ft. respectively. The Bemis set (p) provides modular flexibility without selectivity and the set (p,o) provides selectivity without modular flexibility. Since both these sets are additive sets it will be seen that additivity, while a necessary condition, is not for our purpose a sufficient condition. The simplest set of dimensions which combines flexibility with selectivity is the special case of the general solution which is based on just two design-modules. We therefore justify the form of solution which has been proposed on the grounds that any other solution of the correct type will necessarily be more complicated and should not be contemplated unless the simpler solution proves to be inadequate.

Are Sizes Best for Purpose?

Having decided to use sets based on just two design-modules we must next try to decide whether the sizes chosen are the best for the purpose. The central position is occupied by the pair of design-modules 32 in. and 36 in. which are combined to form larger design-modules, such as the pair 36 in. and 64 in., and broken down to form smaller design-modules, such as the pair 12 in. and 20 in. and the single ' design-module ' 4 in. The dimension 36 in. is a rather obvious choice in a British system. If there is any doubt it will probably be centred upon the choice of 32 in. rather than, say, 28 in. or 40 in. as the second design-module, because there can be little doubt that we are justified in identifying both these design-modules with a significant measure of the human scale as expressed in the width of a door. We make three points about the selection of 32 in. rather than 28 in. or 40 in.

In the first place it is very convenient to be able to incorporate immediately, without changing to smaller design-modules, at least one of the two principal widths of door frames, 32 in. and 36 in., in every dimension of the sets (p, q) and (p, q)' rather than the smaller width 28 in. suitable for cupboards, toilets or bathroom, or the rather oversize dimension 40 in.

In the second place combinations of 32 in. and 36 in. will reproduce every dimension on the 4 in. grid from the critical dimension 18 ft. 8 in. upwards (see Appendix). In fact reference to the Table will show that the set (p, q)' includes every dimension from 13 ft. 4in. upwards except the three dimensions 15 ft. 4in., 15 ft. 8 in. and 18 ft. 4 in. This means that we can normally adjust the larger of the overall dimensions of an ordinary dwelling to one module and nearly always adjust the smaller dimension to one module without using units of design, design-modules, smaller than 32 in. and 36 in.

The critical dimension for the pair 36 in. and 40 in. is 24 ft., which means that it is rather more difficult to adjust the smaller of the overall dimensions to one module if the set is based on the design-modules 36 in. and 40 in. instead of upon 32 in. and 36 in. For the pair 28 in. and 36 in. the critical dimension is 16 ft. which means that it is easier to adjust the smaller of the overall dwelling dimensions to one module if the set is based on the design-modules 28 in. and 36 in. instead of upon 32 in. and 36 in.

These considerations, taken alone, are not conclusive. They do, however, support the identification of the design-modules with widths of door frames. By doing so we are using the largest design-modules consistent with the maintenance of the facility to adjust overall dwelling dimensions to one module. We now come to the third point.

The floor-to-floor height is obviously an important dimension. It is the unit of repetition of the structure in the vertical direction and is, in a sense, also a measure of the human scale. For the ordinary dwelling we look to the 9 ft. group of dimensions, that is, to combinations of the design-modules taken three at a time, to provide a floor-to-floor height. The groups of dimensions arising from different choices of design-modules are tabulated below:

28 in./36 in.		32 in./36 in.		36 in./40 in.	
ft.	in.	ft.	in.	ft.	in.
7	0	8	0	9	0
7	8	8	4	9	4
8	4	8	8	9	8
9	0	9	0	10	0

If we adopt a standard overall depth of flooring of 8 in. we derive from these dimensions the following dimensions for the floor-to-ceiling height.

28 in./36 in.		32 in./36 in.		36 in./40 in.	
ft.	in.	ft.	in.	ft.	in.
6	4	7	4	8	4
7	0	7	8	8	8
7	8	8	0	9	0
8	4	8	4	9	4

There seems to be little doubt that these considerations favour the use of the design-modules 32 in. and 36 in. The group of dimensions arising from this pair most effectively straddles the floor-to-ceiling height 7 ft. 6 in. of interest in low-cost housing. Moreover, a useful range of floor-to-ceiling heights would still emerge from this group if the overall depth of flooring were increased to 12 in.

When all three points which have been made are taken in conjunction it does not seem easy to escape the conclusion that the choice of the design-modules 32 in. and 36 in. as the pair upon which to base the system is the most appropriate. These design-modules dominate the structure of the system. The derived design-modules play an important, but secondary, role in this respect.

Larger Design-Modules: Little Latitude

There is little latitude in the choice of the larger design-modules. In the first place they must be combinations of 32 in. and 36 in. in order to co-ordinate the dimensions of the more selective sub-set (p,q) with those of the set (p,q)'. Second, if a substantially larger pair than 36 in. and 64 in. $=2\times32$ in. are chosen it results in too little flexibility to be of much use in connection with the

TABLE: CLASSIFICATION OF DIMENSIONS ON A 4 IN. GRID

Notation: (p,q) = p × 36 in. + q × 64 in.,
(p,q)′ = p × 32 in. + q × 36 in.,
(p,q)″ = p × 12 in. + q × 20 in.,
(p) = p × 4 in.

Dimension ft.	in.	Combination	Dimension ft.	in.	Combination	Dimension ft.	in.	Combination	Dimension ft.	in.	Combination	Dimension ft.	in.	Combination	Dimension ft.	in.	Combination
	4	(1)	5	4	(0,1)	10	4	(2,5)″	15	4	(12,2)″	20	4	(5,1)	25	4	(5,4)′
	8	(2)	5	8	(1,1)′	10	8	(0,2)	15	8	(4,7)″	20	8	(1,6)′	25	8	(5,2)
1	0	(1,0)″	6	0	(2,0)	11	0	(3,1)′	16	0	(0,3)	21	0	(7,0)	26	0	(3,6)′
1	4	(4)	6	4	(3,2)″	11	4	(2,1)	16	4	(5,1)′	21	4	(0,4)	26	4	(7,1)
1	8	(0,1)″	6	8	(0,4)″	11	8	(1,3)′	16	8	(2,2)	21	8	(7,1)′	26	8	(0,5)
2	0	(2,0)″	7	0	(2,3)″	12	0	(4,0)	17	0	(3,3)′	22	0	(2,3)	27	0	(9,0)
2	4	(7)	7	4	(4,2)″	12	4	(4,5)″	17	4	(4,1)	22	4	(5,3)′	27	4	(2,4)
2	8	(1,0)′	7	8	(6,1)″	12	8	(6,4)″	17	8	(1,5)′	22	8	(4,2)	27	8	(7,3)′
3	0	(1,0)	8	0	(3,0)′	13	0	(8,3)″	18	0	(6,0)	23	0	(3,5)′	28	0	(4,3)
3	4	(0,2)″	8	4	(1,1)	13	4	(5,0)′	18	4	(10,5)″	23	4	(6,1)	28	4	(5,5)′
3	8	(2,1)″	8	8	(1,2)′	13	8	(1,2)	18	8	(7,0)′	23	8	(1,7)′	28	8	(6,2)
4	0	(4,0)″	9	0	(3,0)	14	0	(3,2)′	19	0	(1,3)	24	0	(8,0)	29	0	(3,7)′
4	4	(1,2)″	9	4	(6,2)″	14	4	(3,1)	19	4	(5,2)′	24	4	(1,4)	29	4	(8,1)
4	8	(3,1)″	9	8	(8,1)″	14	8	(1,4)′	19	8	(3,2)	24	8	(7,2)′	29	8	(1,5)
5	0	(0,3)″	10	0	(0.6)″	15	0	(5,0)	20	0	(3,4)′	25	0	(3,3)	30	0	(10,0)
															and so on		

range of dimensions which arise in an ordinary dwelling, although a larger pair formed from combinations of 36 in. and 64 in., such as 36 in./100 in. or 64 in./100 in., may well find application in connection with larger types of construction. The design-modules 36 in. and 64 in. are very convenient because their use ensures that there is an immediate choice of a width of door frame of 36 in., and sometimes of 32 in. and 28 in. as well, in every dimension of the set (p, q). This is because 64 in. may be interpreted as 2 × 32 in. or 28 in. + 36 in. These dimensions are, incidentally, biased towards brick dimensions.

As regards the smaller design-modules, 12 in. and 20 in., the choice of 12 in. is rather obvious, that of 20 in. instead of 16 in. is less so. In this connection we make just two points. Since there appears to be no obvious advantage in choosing 16 in. rather than 20 in. we prefer the larger design-module on the grounds that its use promotes selectivity. In the second place we note that the metric analogue of 20 in. is 50 cm. which is therefore likely to play a dominant role in a metric system which is similarly constructed.

6. Conclusion

The aim of this paper has been to present the theoretical framework of an approach to the essential problem of dimensional co-ordination; namely, to provide a means of selecting dimensions in such a way that the resulting component and design dimensions are explicitly and additively related. Within the limitation imposed by adopting a 4 in. module for the purpose of illustration and with the dimensional requirements of an ordinary dwelling very much in mind, the two dimensions 32 in. and 36 in. emerge as of particular significance. But it must be repeated that the system is quite general in its application and that such other pairs as 33 in./36 in., 31½ in./36 in., 36 in./63 in., and so on, can alternatively be used as a basis.

A decision between these various possible base pairs must depend on their architectural, technical and economic implications. This paper has been concerned only to show the essential merits of a system based on two modular dimensions which reflect a significant measure of the human scale. This is not, however, a very tightly defined measure and there is room for variation in these basic design-modules and in the secondary design-modules, both larger and smaller, which are derived from them. The optimum solution can be determined only by comparing the dimensions arising from a specified set of design-modules with the dimensional requirements of a wide range of building types.

Appendix

There is a theorem in the additive theory of numbers which provides some useful general information about the properties of a set of numbers derived by combining a given pair of numbers in all possible ways. By means of a module results about the combination of numbers can easily be converted into results about the combination of dimensions, and 'vice versa.' The module involved in any given set of dimensions is, of course, the largest dimension appearing as a common factor of all the dimensions in the set.

From the point of view of applications it is convenient to express the number theorem in dimensional form:

Theorem. If a and b are two dimensions containing no common factor greater than the module m, every dimension on a grid of spacing m from a critical dimension $N=(a/m-1)(b-m)$ upwards can be obtained from a combination of a and b in the form $p\times a+q\times b$, where p and q are positive whole numbers or zero. Below N just $N/2m-1$ dimensions on the grid of spacing m can be obtained from combinations of a and b in the form $p\times a+q\times b$.

ACKNOWLEDGEMENTS. The author would like to thank many of his colleagues who have contributed to the clarification of the ideas presented in this paper.

STUDIOS FOR COMMERCIAL PHOTOGRAPHY.—*London's first purpose-built studio for commercial photography is under construction for Woburn Studios Ltd., in Brewery-road, Pentonville. The in-situ rc frame will be clad in red and white brickwork and the mass concrete bases are to be of sulphate-resisting cement. The cost of the 31,500 sq. ft. studio is £160,000 and completion is for July 1962. The architects are Fitzroy Robinson & Partners, F/ARIBA; consulting engineers, W. E. Budgen & Partners; quantity surveyors, Burley, Lane & Partners; and main contractors, Holland & Hannen and Cubitts (Great Britain) Ltd.*

THE BUILDER LONDON MEASURED RATES

These prices for new building work in London normally appear in the first issue of each month only. The prices are inclusive of all allowances for National Insurance, Holidays with Pay and Public Holidays, Third Party Risk, Travelling Allowances and Guaranteed Week. They cover a profit of 10 per cent on the prime cost without any addition for establishment charges.

These rates do not include for Foremen and other preliminary items, such as office, sheds, plant and scaffolding, etc., and these must be added accordingly.

The basic cost of the labour and materials used in arriving at the rates has been derived from the 'Current Prices of Materials' published in *The Builder*.

The data given are copyright. While every endeavour is made to ensure accuracy, we do not hold ourselves responsible for any error that may occur.—EDITOR.

EXCAVATOR

All hand labour	*Per yd. cube*									
	Loose earth		*Firm soil*		*Stiff clay*		*Chalk and flints*		*Rock, etc., no blasting*	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Surface excavation to shallow depths	8	3	10	3	11	9	17	10	46	0
Bulk do. or large trenches, etc., not exceeding 5 ft. deep	7	6	9	4	10	9	15	10	42	0
Trenches do. under 4 ft. 6 in. wide and do.	10	0	12	1	14	0	20	8	55	0
Pier holes and similar under 6 ft. square and do.	11	3	13	10	16	2	23	9	61	6
Additional throw for every 5 ft.:										
Bulk excavation	3	9	3	9	5	5	5	5	6	2
Trench "	5	0	5	0	6	8	6	8	7	8
Pier "	5	7	5	7	7	6	7	6	8	6
Return, fill and ram	5	2	5	2	6	8	6	8	8	2
Wheeling surplus n.e. 100 yds. run and depositing	7	2	8	0	8	0	8	0	9	0
Underpinning in trenches	13	4	18	6	21	6	30	9	—	

	s.	d.
Loading lorries and transporting to tip ... ... Yd. cube	16	5
Basketing out and depositing ... ... "	10	0
Planking and strutting to sides of surface or basement trenches :		
Depth up to 5 ft. ... ... Ft. sup.		6
" " 10 ft. ... ... "		8
" " 15 ft. ... ... "		9
Hardcore :		
Filled-in layers and consolidated ... ... Yd. cube	22	3
do. 4 in. thick ... ... Yd. sup.	3	3
do. 6 in. thick ... ... "	4	4

CONCRETER

	Basic yard cube rates							
	1:12		1:3:6		1:2:4		1:1½:3	
Aggregate	1½ in. all-in		1½ in.		¾ in.		½ in.	
Concrete in normal foundations : (minimum 8-ton cement loads)—	s.	d.	s.	d.	s.	d.	s.	d.
Portland cement standard specification	67	0	75	3	82	8	87	0
Portland cement rapid hardening	68	3	77	1	85	2	90	4
Water-repellent cement	71	0	81	0	91	0	97	6

	s.	d.
Add to above basis for :		
4 in. surface beds ... ... Yd. sup.		7½
6 in. " " ... ... "		8½
(If above two items worked around mesh reinforcement, add 5d. per yd. *super.*)		
Foundations in underpinning in short lengths ... Yd. cube	16	4
Beds and flaunchings to drains ... ... "	8	2
Pier or stanchion foundations—small ... ... "	4	1
Sundry small items not exceeding 3 ft. cube in plinths, curbs, padstones, etc. ... ... "	21	6

REINFORCED CONCRETE

ADD to above 'Basic Yard Cube Rates'

Reinforced concrete including working around reinforcement between formwork and hoisting to normal levels :	s.	d.
Foundations and similar ... ... Yd. cube	5	5
Isolated stanchion or pier bases ... ... "	6	5
Walls not exceeding 6 in. thick ... ... "	26	8
" " " 12 in. " ... ... "	18	8
Suspended floors or flat roofs 4½ in. thick ... ... Yd. cube	21	6
" " " " 6 in. " ... ... "	17	5
" " " " 9 in. " ... ... "	14	10
(Beams attached to floors or flats, *add* 6/8 yd. cube)		
Isolated beams or lintels average 72 sectional inches ... "	32	3
Do. average 144 sectional inches ... ... "	24	1
Columns or stanchions average 72 sectional inches "	37	8
" " " " 144 " " "	29	5
Staircases and landings, etc. ... ... "	56	1
Shell roofs average 3 in. thick, including labour forming curved surface ... ... "	133	3
Hollow tile floors :		
Hollow clay tiles 4 in. thick with 1 : 2 : 4 concrete ribs at 14 in. centres with filler tiles and 1½ in. fine concrete screed (excluding reinforcement and form work) ... ... Yd. sup.	19	4
All as above but 6 in. thick clay tiles ... ... "	23	5
" " " " 9 in. " " " ... ... "	32	7
Sundry items :		
2 in. concrete (1 : 2 : 4) blinding bed ... ... Yd. sup.	5	0
Spade finish to concrete beds ... ... "		10
Trowel " " " ... ... "	1	10
Laying to falls and currents ... ... "	1	0
Hacking concrete by hand ... ... "	2	8
Hacking concrete by use of proprietary liquids ... "	1	7
Damp-proof membrane in three coats with sanded key ... ... "	4	10
¾ in. Bitumen expansion joints 4 in. deep in floors ... Yd. run	3	11

	Mild steel rods (round) cut, bent, hooked, wired and fixed complete (Ex. London Stock)							
	¼ in.		⅜ in.		½ in.		⅝ to 1 in.	
Reinforcement :	s.	d.	s.	d.	s.	d.	s.	d.
Floors beams laid in only ...	88	6	79	4	73	8	70	3
" " " wired into frames	100	7	90	0	85	10	80	3
Walls wired into frames	100	7	90	0	85	10	80	3
Columns wired into frames ...	100	7	90	0	85	10	80	3
Staircases wired into frames ...	102	11	92	4	88	2	82	7

	s.	d.
Steel mesh fabric reinforcement :		
Laid in floors including laps and straight cutting and wiring, etc. :		
Weight 3.94 lb. per yd. sup. ... ... Yd. sup.	4	3
" 4.71 lb. " " " ... ... "	4	6
" 9.32 lb. " " " ... ... "	8	4
Raking cutting worth 6 in. material cost per ft. run		
Circular cutting worth 9 in. material cost per ft. run.		
Formwork (Sawn) including strutting, easing and removal and average four times use of timber :		
Soffit of floors and flat roofs ... ... Yd. sup.	16	9
Sloping soffits of stairs ... ... "	22	10
Barrel-vault soffits of floors and roofs ... ... "	21	4
Vertical sides of walls ... ... "	16	0
Battering sides of walls ... ... "	20	10
Columns ... ... Ft. sup.	2	5
Lintels and beams ... ... "	2	7
Staircase strings cut to tread and riser ... ... Ft. run	3	7
Edges of concrete floors, etc., up to 12 in. deep per inch in height ... ... "		2½
Rebates or similar per inch girth up to 6 in. girth ... "		2½
Raking cutting ... ... "		8½
Extra cost for wrought shuttering and labour rubbing down to leave fair face on concrete ... Yd. sup.	2	7
Pre-cast Concrete (1 : 2 : 4) *including fair face :*		
4½ in. x 6 in. reinforced lintels ... ... Ft. run	3	0
9 in. x 6 in. " " ... ... "	5	3
9 in. x 9 in. " " ... ... "	8	7
Steel Formwork :		
Steel shuttering forms with patent expanding floor centres and telescopic props not less than four times use on each job with continuous use ... Yd. sup.	11	6

Partitions : (Minimum 100 yd. super)	*Yd. super rate*			
	2 in.	*3 in.*	*4 in.*	*6 in.*
	s. d.	s. d.	s. d.	s. d.
Clinker concrete slab partitions in cement mortar	9 9	12 6	14 9	—
Cranham terra cotta slab partitions in cement mortar	14 1	17 0	20 0	—
Moler partition block partitions in cement mortar	19 10	23 0	25 11	—
Thermalite-Ytong partition blocks in cement mortar	—	15 8	19 4	27 7
'Phorpres' hollow clay partition blocks in min. of 6-ton loads ...	10 3 (2½ in.)	12 2	15 2	24 11

Cuttings :

Raking cutting and waste=½ of ft. sup. rate
Circular „ „ „ =¼ of ft. sup. rate
Cutting around openings=½ of ft. sup. rate
Cutting and bonding at angles, intersections and ends all at 6d. ft. run.

BRICKLAYER	*Yd. super rates*			
	Plain flettons	*Rough stocks*	*Second stocks*	*Blue wire-cuts*
Brickwork in cement mortar (1 : 3) reduced to one brick thick	s. d. 38 5	s. d. 51 8	s. d. 61 4	s. d. 93 10
Deduct if in 1 : 1 : 6 cement-lime mortar	10	10	10	10
Add if in :				
Filling in openings	5 8	5 8	5 11	7 2
Backing to masonry	2 10	2 10	3 0	3 8
Building overhand	1 10	1 10	1 11	2 2
Raising on existing work	2 10	2 10	3 0	3 8
Circular on plan to quick sweep ...	5 6	5 6	5 9	6 10
Small detached piers, plinths, etc.	8 4	8 4	8 9	10 5
Underpinning	5 6	5 6	5 10	6 11
Brick-on-edge walls	13 2	18 2	21 2	—
Half-brick sleeper walls honeycombed	13 9	18 7	—	—
Half-brick walls	21 6	29 3	33 11	51 5
do. with fair face and pointing both sides as work proceeds	24 8	—	37 3	54 6
One-brick wall with fair face and pointing both sides as work proceeds	43 8	—	66 4	99 8
11 in. cavity brick wall with two half-brick skins with 2 in. cavity and three galvanised iron twisted ties to every yd. sup.	46 3	—	71 2	—

Sundry items :		s. d.
Horizontal double slate damp-proof course ...	Ft. sup.	3 4
Vertical „ „ „ „ ...	„	4 1
Hessian-base bitumen damp-proof course	„	1 6
Levelling and preparing for raising on	„	1 0½
Cutting, toothing and bonding new to old	„	3 8
Wedging and pinning with slates in underpinning ...	„	5 2
Rough cutting	„	6
Cutting and fitting brickwork around steel	„	6
Bed and point frame one side	Ft. run	4
Rough cutting squint or birdsmouth	„	6½
Labour plumbing angles on faced work	„	2½
Rake out and point to lead flashing	„	7½
„ „ „ „ stepped flashing		10½
Cutting groove for skirting and point	„	1 7
Shallow chases for small pipes and conduit	„	1 9
Metal reinforcement 24 gauge 2½ in. wide	„	4½
Faced work : (Flemish bond) :		
Add or deduct for every 10s. per 1,000 difference from basic price of common bricks in Flemish bond in solid work	Yd. sup.	9
do. to half-brick wall in stretcher bond	„	6½
Add for extra labour to each side in facings and pointing as work proceeds	„	3 2
do. butt joints raked out and pointed with special mortar	„	6 3
If built in English bond, add 12½ per cent to above items.		
Labours :		
Fair cutting	Ft. run	1 1½
Fair circular cutting	„	1 4
Fair squint or birdsmouth cutting	„	1 9

Copings :		*9 in. wall*	*14 in. wall*
		s. d.	s. d.
Brick-on-edge coping in flettons finished fair and pointing as work proceeds ...	Ft. run	2 5	3 3
Add for every increase by 10s. per 1,000 in cost of superior bricks	„	1	1½
Add for two courses of roofing tiles unde and cement weather fillets on both sides	„	3 7	4 4
Cills :			
Two courses of roofing tiles laid breaking joint in cement mortar, set weathering and pointing ...	Ft. run	3 7	
Arches :			
Extra over fletton brickwork for brick-on-end flat arch 4½ in. on soffit and 9 in. high in facings p.c. 350s. per 1,000 and pointing	Ft. run	3 7	
Extra over fletton brickwork for fair axed arch in stock facings p.c. 350s. per 1,000 and pointing (cuttings measured separately)	Ft. sup.	9 3	

CURTAIN WALLING

Curtain walling of hollow, extruded, aluminium alloy mullion and transom units fixed together to form a grid to conventional steel and concrete framework, including glazing complete and a reasonably priced infilling panel and subject to the number of vents, etc., required, a fair average price is from 22/- to 27/6 per ft. sup.

PAVIOR

	Yd. super rates			
	½ in.	*¾ in.*	*1 in.*	*1¼ in.*
	s. d.	s. d.	s. d.	s. d.
Cement screed (1 : 3) to receive pavings	4 5	5 3	6 1	6 11

Add to above for :		d.
Trowelling smooth	Yd. sup.	7
Narrow widths or small quantities—add 25 per cent. to plain surfaces : Laying to falls	„	4

	Yd. super rates			
	1 in.	*1¼ in.*	*1½ in.*	*2 in.*
	s. d.	s. d.	s. d.	s. d.
Granolithic paving (1 : 2½) laid on concrete	8 9	9 11	12 0	13 2

Add to above for :		s. d.
Narrow widths or small quantities—add 25 per cent. to plain surfaces.		
Surface hardening with three coats of silicate of soda	Yd. sup.	1 5
Carborundum finish with 2 lb. per yd. sup. trowelled in	„	3 0
¾ in. skirting 5 in. high covered at bottom and fair top edge ... ... Mitres and ends—7d. each.	Ft. run	2 9
Composition flooring ½ in. thick	Yd. sup.	18 0
Terrazzo paving ⅜ in. thick	„	45 0
Rubber flooring ¼ in. thick	„	65 0

ASPHALTER

Asphalt roofing :		*Mastic BSS 988* s. d.	*Natural rock BSS 1162* s. d.
¾ in. flat to falls in two thicknesses on felt underlay on prepared screed	Yd. sup.	14 3	20 0
do. in small quantities or narrow widths	Ft. sup.	2 0	2 9
6 in. high skirting with angle fillet and splayed edge at top	Ft. run	2 7	3 0
External angles on do.	No.	7	7
Internal angles on do. ... ... „		7	7

Asphalt Damp-Proof Course and Tanking :		*Mastic BSS 1097* s.	*Natural rock BSS 1418* d. s. d.
Vertical damp-proof course in 2 thicknesses	Yd. sup.	21 0	27 0
do. in narrow widths	Ft. sup.	2 6	3 4
¾ in. Horizontal damp-proof course in two thicknesses	Yd. sup.	14 4	19 9
do. in narrow widths	Ft. sup.	1 10	2 6
Vertical tanking in three thicknesses ...	Yd. sup.	25 0	31 4
1½ in. Horizontal do. in three thicknesses	„	19 3	29 2
Labour double angle fillet	Ft. run	1 4	1 4

DRAINLAYER

	Per yd. run Depth of trench				
	2 ft.	3 ft.	4 ft.	5 ft.	10 ft.
Excavate trench, part return fill and ram and remove surplus, inc. planking and strutting. (In firm soil—if in clay or chalk adjust in accordance with previous excavation rates)	s. d. 8 3	s. d. 21 7	s. d. 28 10	s. d. 36 0	s. d. 106 3

	Per yd. run		
	4 in.	6 in.	9 in.
Concrete (1 : 6–1½ in agg.) 12 in. wider than external diameter of pipe in 4 in. bed and benching up on both sides	s. d. 8 0	s. d. 8 10	s. d. 11 3
do. but 6 in. bed and do.	9 7	11 3	13 7
do. but 4 in. bed and surround to pipe	11 7	14 5	19 0
do. but 6 in. bed and surround to pipe	15 7	18 10	23 9
	Per ft. run		
Salt glazed drain pipes laid and jointed in trench (Minimum two-ton loads) :	4 in. s. d.	6 in. s. d.	9 in. s. d.
'Seconds'	2 10	4 0½	6 5¼
'Best'	3 1½	4 5½	7 3
'Best Tested'	3 10½	5 6½	9 2¼
'British Standard'	3 3¾	4 9	7 9½
'British Standard Tested'	4 1	5 10	9 7¼
Extra for bends 'Best' quality	4 4	6 5	18 6
Extra for junctions 'Best' quality	7 8	10 10	23 4
Cast-iron drain pipes to BSS 437 laid and jointed with molten lead in trench	15 3	22 6	—
Extra for :			
Short lengths	4 0	5 1	—
Bends and extra joints	22 6	59 0	—
Junctions and do.	46 3	102 8	—
Cast-iron gulley trap with 9½ in. x 6½ in. grating and joint	45 2	—	—
Cast-iron rainwater shoe with vertical inlet, inspection door and bedding and joints ...	70 3	—	—
Cast-iron inspection fittings with single branch fitting one side	164 0	—	—

	Per ft. run		
	3 in.	4 in.	6 in.
Pitch fibre pipes to BS 2760 and laying and jointing in trench (in loads of £60 to £250)	s. d. 2 6	s. d. 3 3	s. d. 6 2

		4 in.	6 in.
Manhole items :		s. d.	s. d.
Brown glazed stoneware straight, half-round channels	Each	5 4	7 8
do. ordinary channel bends... ...	„	11 10	16 11
Three-quarter section curved channel bends with splayed ends	„	15 0	21 6
Cast-iron heavy galvanised steps	Each		13 0
Bedding and sealing medium weight manhole covers and frames (cost of cover to add)...	„		10 0
do. heavy road covers and frames	„		13 3

MASON

		Per ft. cube		
		Bath	Portland	York
Stone and all labours fixed in :		s. d.	s. d.	s. d.
Ashlar average 6½ in. on bed ...	Ft. sup.	32 8	37 5	39 0
Moulded string course 9 in. x 6 in.	Ft. run	28 4	31 0	33 10
Moulded cornice 18 in. x 9 in. ...	„	71 6	77 6	82 6
Weathered and throated cills :				
9 in. x 3 in.	„	17 10	19 3	20 7
12 in. x 6 in.	„	35 9	38 0	40 2
Weathered and throated copings:				
12 in. x 3 in.	„	19 3	21 0	21 9
14 in. x 6 in.	„	38 0	43 0	44 6
Plinth rubbed top and face size :				
4½ in. x 9 in.	„	19 6	21 9	21 0
Plain steps, size 12 in. x 6 in. ...	„	—	—	35 9
„ „ „ 14 in. x 2 in. ...	„	—	—	16 9
Riser, size 2 in. x 4 in. ...	„	—	—	8 0
2 in. Sawn paving edges squared in random sizes	Yd. sup.	—	—	98 0
Supplied only :				
Templates and cover stones coped edges	Ft. cube	—	—	33 6

ROOFER

	Yd. sup.
	s. d.
Bituminous built-up roofing in two layers of felt, the first layer 45 lb. and the second 55 lb. to BS 747, covered with limestone or granite chippings n.e. ¼ in. thick	10 0
All as above but in three layers, the first and second layers in felt 45 lb.	13 9

	Steel Tees at	
	2 ft. 0½ in. centres	4 ft. 0½ in. centres
2 in. compressed straw building slabs in standard sizes fixed complete with 18G steel tees with fixing clips to steel structure to form roof decking :	s. d.	s. d.
Areas of 50–100 yds. sup.	27 8	21 4
„ 101–250 „	26 10	20 9
„ 251–750 „	26 0	20 3
„ Over 750 „	25 2	19 4
If 16G steel tees are used—Add to above	1 5½	9

Welsh sloting	Per square		
	16in.x8in.	18in.x10in.	20in.x10in.
Laid with 3 in. lap and 2 zinc nails each slate	s. d. 382 0	s. d. 411 0	s. d. 509 0
Additional labours :			
Top edge cutting ... Ft. run	9	9	9
Square abutment do. „	9	9	9
Double course at eaves... „	1 3	1 3	1 3
Raking, cutting and waste „	11	11	11
1½ in. x ¾ in. slate battening for last ... ... Per sq.	36 9	33 0	29 3

Roof Tiling	Per square		
	Berkshire hand-made	Stafford machine made	Concrete Tiles
Roof tiling with 10½ in. x 6½ in. tiles laid to a 4 in. gauge, every fourth course fixed with two galvanised nails	s. d. 264 0	s. d. 253 0	s. d. 163 3
1 in. x ¾ in. tile battening for last	39 6	39 6	39 6
Additional labours :			
Top edge cutting ... ... Ft. run	9	9	9
Square abutments do. ... „	9	9	9
Raking cutting to hips ... „	11	11	11
Eaves course ... ... „	11	11	11
Half-round ridge and hip tiles ... „	2 11	2 11	2 11

CARPENTER AND JOINER

	Ft. cube			
	Plates	Joists	Rafters & Partitions	Roof trusses
Softwood carcassing, including all waste, nails, hoisting and fixing	s. d. 17 1	s. d. 19 10	s. d. 22 10	s. d. 27 4

	Per square		
	¾ in.	1 in.	1¼ in.
Boarding and Flooring : (Softwood) :	s. d.	s. d.	s. d.
Rough boarding to flats and roof... ...	126 9	162 3	197 7
Softwood plain edge flooring cleaned off	156 9	175 9	213 10
Tongued and grooved flooring cleaned off	170 9	197 7	239 10

		s. d.
Extra for 2 in. x 3 in. average firrings	Per sq.	81 7
Herringbone strutting to 2 in. x 8 in. joists	Ft. run	1 10
1 in. gutter boarding and bearers	Ft. sup.	3 9
Raking, cutting and waste on 1 in. flooring	Ft. run	9
Composition Boards, etc. :		
¼ in. hardboard to BS 1142 fixed to vertical battens	Yd. sup.	6 9
½ in. insulation board to BS 1142 do. do.	„	6 11
1 in. woodwool slabs fixed to flat or sloping soffits	„	9 7
2 in. compressed straw building slabs in standard sizes fixed to wood bearers to flat or sloping surfaces in quantities of 101 to 250 yds. super	„	14 8
¼ in. flat asbestos sheeting fixed vertically	„	11 0

Wood Block Flooring :

				s. d.
1 in. nominal West African mahogany flooring laid herringbone pattern in mastic...	Yd. sup.	34	6
1 in. do. Agba	,,	34	6
1 in. do. Sapele	,,	36	3
1 in. do. Beech	,,	39	0
1 in. do. Rhodesian Teak	,,	52	0

Extra for preparing and polishing 2/3 yd. sup.

	Sectional area		
	n.e. 4 in.	*4–6 in.*	*ex. 6 in.*
Skirtings :	s. d.	s. d.	s. d.
Softwood skirting with rounded or moulded edge, planted on including all labours in short lengths, mitres, etc., per in. in sectional area	3¾	3¼	2¾

Labours over 6 in.—Mitres=1 ft. run. Return mould ends=1 ft. 6 in. run
Sawn grounds nailed 3¼d. ft. run. If plugged + 7d. ft. run.

	Ft. super	
	Large sqrs.	*Small sqrs.*
Sashes and Frames : (Softwood) :	s. d.	s. d.
1¼ in. rebated, rounded or moulded fixed	3 7	5 9
2 in. ,, ,, ,, ,, ...	4 0	6 2
Add for hanging on butts ... ... each	2 9	2 9
Double-hung sashes and frames with oak cills, purpose-made and not less than 1 doz. in each order: Quantities under 1 doz.—add up to ⅓ according to quantity. (Average size 4 ft. x 5 ft.)	10 8	14 6

Extra cost of boxed mullions 1s. ft. sup.
Extra for hanging sashes with lines, weights and axle pulleys 47s. each.

	Ft. super			
	1¼ *in.*	1½ *in.*	1¾ *in.*	2 *in.*
Doors: (All-purpose-made) (Softwood)	s. d.	s. d.	s. d.	s. d.
Softwood skeleton framed with hardboard flush both sides (standard internal pattern)	3 7	4 0	4 5	4 10
Framed, ledged and braced	—	5 1	6 2	6 4
Four panel square framed both sides	4 10	5 7	6 7	6 10
Add for each side moulded on last ...	6	6	6	6
do. flush framed	1 0	1 1	1 3	1 3
do. bead and butt do. ...	1 3	1 4	1 6	1 6
do. bolection moulded do. ...	1 6	1 6	1 6	1 6
do. raised and fielded do. ...	—	2 4	2 4	2 4

Rebated and beaded meeting stile 4d. ft. run.
Dwarf doors add up to 50 per cent. according to size.

	Sectional area			
	n.e. 6in.	*6-12 in.*	*ex. 12in.*	
Window and Door Linings and Frames :	s. d.	s. d.	s. d.	
Softwood linings per inch of sectional area	4½	4	3½	
Add for cross-tongueing	—	1		
Frames, including rebating and once moulded or equivalent of two run labours, per sectional inch	4	3½	3	

Transomes and cills plus 10 per cent. on frames.
Additional run labours plus 1½d. per ft. run.

	Per ft. run			
	Sectional area			
	1 *in.*	2 *in.*	4 *in.*	6 *in.*
Softwood Bearers, Fillets and Mouldings, etc. :	s. d.	s. d.	s. d.	s. d.
Wrot grounds, bearers, fillets, etc.	4½	7	11	1 3
Mouldings, picture rails, architraves, etc.	5	7½	11½	1 4
Framed legs and bearers or similar	9	11	1 4	1 10
Glazing heads, mitred and bradded	6	8½	—	—
Add for plugging	6	6	6	6
Add for brass cups and screws ...	2½	2½	2½	2½

	Thickness			
	¾ *in.*	1 *in.*	1¼ *in.*	1½ *in.*
Shelving (Softwood) :	s. d.	s. d.	s. d.	s. d.
Slat shelving 2 in. wide spaced 1 in. between ... ... Ft. sup.	2 0	2 3	2 8	3 1
9 in. shelving... ... ... Ft. run	2 0	2 4	2 10	3 6
Shelving over 9 in. wide ... Ft. sup.	2 7	2 11	3 7	4 2

1 in. x 2 in. chamfered bearers in short lengths, plugged, each 2s. 3d.

	Ft. super	
	1 *in. treads*	1¼ *in. treads*
Staircases (Softwood) :	s. d.	s. d.
Treads and risers with moulded nosings, glued, blocked and bracketed on carriages	6 3	7 0
Cross-tongued winders	8 3	9 4

		s. d.
Strings, framed	Ft. run	4 9
Housings for treads and risers	Each	3 0
1 in. x 1 in. sq. balusters framed each end on rake ...	,,	4 1
3½ x 3½ in. sq. framed newel...	,,	5 2
Mahogany handrail, average 3 in. x 3 in.	Ft. run	8 10
,, ,, ramped	,,	26 0

FIXING ONLY IRONMONGERY

All to Softwood :	*Each* s. d.		*Each* s. d.
Barrel bolts	1 9	Rim locks	5 2
Flush bolts	6 3	Mortice locks	11 0
Sash fasteners	3 4	Overhead door springs...	14 6
Casement fasteners ...	2 3	Patent floor springs and oil	36 3
Cupboard locks	5 0		

FOUNDER AND SMITH

		s. d.
Fabricated steelwork of basis section including hoisting and fixing at various levels :		
Rolled steel joists	per cwt.	90 0
Compound girders	,,	97 0
Stanchions	,,	102 3
Compound stanchions	,,	108 0
In roofwork—trusses and purlins ... ... (Average prices, not for awkward work)	,,	122 0
Cleats, brackets, packing pieces, etc., in connections, including rivets and bolts	,,	147 6
Wrot iron framed cat ladders	,,	148 0
	to	168 0

PLUMBER

	Per ft. run		
	3 *in.*	4 *in.*	5 *in.*
Cast iron rainwater goods : (Under 5 cwt. lots) :	s. d.	s. d.	s. d.
Half-round gutter jointed in red lead and bolted and fixed with iron brackets	3 3	3 11	4 9
Extra for stop ends ... ... each	2 5	3 0	3 11
do. angles or outlets ... ... ,,	5 10	6 2	7 3
O.G. gutter of ⅛ in. metal fixed as above	3 9	4 4	5 1
Extra for stop ends ... ... each	2 9	3 4	4 4
do. angles or outlets ... ... ,,	6 7	6 9	8 1
	2 *in.*	3 *in.*	4 *in.*
Rainwater pipe jointed in red lead and tow fixed to brickwork with pipe nails and distance pieces: ⅛ in. metal	4 6	5 1	6 7
Extra for shoes ... ... each	5 0	6 10	9 2
do. bends ... ... ,,	5 11	8 6	11 0
do. junctions ... ... ,,	8 1	11 6	15 0
Cast iron soil and waste pipes : (Under 5 cwt. lots) :	2 *in.*	3 *in.*	4 *in.*
Soil, waste or ventilating pipes with caulked joints fixed to brickwork with pipe nails and distances pieces : 13/64 in. metal	6 5	7 6	9 10
Extra for bends ... ... each	14 1	16 9	21 0
do. junctions ... ... ,,	17 5	24 3	30 5
do. oval access door to any fitting ,,	16 6	16 6	21 3
Extra cost for type 'E' holderbat fixing and cutting and pinning to brickwork ft. run	1 6	1 7	1 7½

	Soakers	Flats	Gutters, valleys, etc.	Flash-ings	Stepped Flash-ings
External leadwork: (Over 1 ton):	s. d.	s. d.	s. d.	s. d.	s. d.
Milled lead and labour in per cwt.	141 4	166 11	179 11	186 5	199 5

Labours, etc.: Double welt	ft. run		1 0
Copper nailing: Open	,,		7
Close	,,		1 0
Soldered seam	,,		6 7

	2 *in.* x 10 *lb.*	3 *in.* x 15 *lb.*	4 *in.* x 19 *lb.*
Lead pipes: (Over 1 ton):	s. d.	s. d.	s. d.
Soil, waste and ventilating pipes, fixed to walls with plain lead tacks and brass screws ... ... per ft.	10 11	14 4	18 9
Extra for: Lengths under 4 ft. ... ,,	3 0	3 6	4 6
Bends ... ... No.	12 6	23 9	24 10
Wiped soldered joints ... ... ,,	20 0	29 7	33 7
,, branch joints ... ... ,,	24 4	35 0	39 3

	Per ft. run					
	½ *in.*	¾ *in.*	1 *in.*	1¼ *in.*	1½ *in.*	2 *in.*
Lead pipes including running joints:	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Main in trench ...	3 4	5 0	7 5	9 3	11 9	16 5
do. fixed with hooks	4 0	5 10	8 8	10 8	13 4	18 3
Service and do. ...	3 5	5 0	6 11	8 3	10 4	13 4
Waste and do. ...	2 8	3 11	5 7	6 7	8 4	10 11
Extra for lengths under 4 ft. ...	9	1 0	1 6	1 9	2 0	2 7
Soldered stop ends ... ... No.	2 6	3 0	3 9	4 6	5 2	6 8
do. joints to fittings ... ,,	6 6	9 2	11 0	13 4	16 3	19 9
do. branch joints... ... ,,	7 2	10 1	12 2	14 10	17 11	21 8
Brasswork:						
Union with red lead joint to iron and soldered joint to lead ... ... ,,	12 0	14 10	18 6	22 9	27 10	40 6
Stop-cock and soldered joints... ... ,,	21 0	30 8	43 7	70 0	89 6	167 5
Bib-cock do. ,,	18 6	24 9	—	—	—	—
Ball-valve do. ,,	18 0	30 4	43 5	71 7	89 6	—
Steel tubing:						
Galvanised tubing Class C laid in trench	2 4	2 6	2 10	4 1	5 6	6 6
do. Class B fixed to walls, etc. ...	2 7	3 0	3 4	4 5	6 2	7 1
Extra for bends No.	5 0	5 9	7 7	9 10	11 8	17 2
Tees ,,	5 8	6 9	8 2	10 10	12 10	18 8
Red lead joints ,,	3 6	3 9	4 1	4 7	5 1	5 7
Copper tubes and fittings: gauge	19	19	18	18	18	17
Tubes and fixing to walls	2 7	3 4	4 6	5 5	6 4	9 2
Extra for lengths under 4 ft. ...	7	9	11	1 0	1 3	1 6
Brass capillary type fittings:						
Couplings—copper to copper ...	3 8	4 4	6 9	8 9	11 2	15 3
Bends— do. ...	5 10	7 1	8 11	11 7	17 2	32 3
Tees— do. ...	8 7	9 11	14 2	19 2	26 3	36 4
Stop cocks	23 7	33 1	60 2	101 2	152 3	250 4
Tank connectors ...	4 9	5 4	8 1	10 2	14 3	18 4

PLASTERER

		s. d.
Expanded metal lathing ⅜ in. mesh 24 gauge ... (not including hangers for suspended work)	Yd. sup.	8 6
Lime Plastering: Render, float and set	,,	9 11
Sirapite Plastering: Render in Portland Cement, Lime and Sand and set in Sirapite	,,	7 9
Sirapite Plastering: Render and set in Sirapite plaster to manufacturer's instructions	,,	8 0
Paristone Plastering: do. do.	,,	8 3
Carlite Plastering do. do.	,,	8 10
Portland Cement: Plain face trowelled smooth ...	,,	9 11
Keenes: Render in cement and lime and set in Keenes	Yd. sup.	10 6
Extra for dubbing out ¼ in. thick 1/11, ½ in. thick 3/11 ¾ in. Plasterboard and setting coat ...	,,	8 11
Narrow widths: Up to 3 in. wide add 300 per cent. Do. 3-6 in. do. 200 per cent. Do. 6-12 in., add 75 per cent.		
Labours: Arris 5½d. Fair edge 6½d. Quirk 10d.		
Plaster Moulded Cornices: 6 in. girth and under ...	Ft. run	3 1
Over 6 in. girth, add 3½d. per in.		
Tyrolean Rendering on and including Portland Cement and Sand backing	yd. sup.	12 8
Wall Tiling: 6 in. x 6 in. white glazed ¼ in. thick ...	,,	45 0
Extra for rounded angle or birdsbeak	Ft. run	4
do. rounded edge tile	,,	5

GLAZIER

	Wood sashes with beads or putty
	s. d.
Clear sheet glass ordinary quality :	
18 oz.	1 5
24 oz.	1 7½
26 oz.	1 10½
32 oz.	2 3½
Obscured glass :	
⅛ in. Figured rolled White group 1	1 10½
,, ,, ,, group 2	2 2½
,, ,, Standard tints	2 6½
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and luminating group 3	2 4
¼ in. Wired Cast	2 7½
¼ in. Georgian Wired Cast	2 8
¼ in. Polished Plate Glass, G.G. Quality :	
In plates not exceeding 2 ft. sup.	6 8½
,, ,, ,, 5 ft. sup.	7 8½
,, ,, ,, 45 ft. sup.	9 8½
,, ,, ,, 100 ft. sup.	9 7½
Extra on all above :	
For glazing with screw beads ft. sup. ... ... (Excepting polished plate over 12 ft. super on which no extra is charged)	5½
For glazing with metal sashes with putty	1
Glazing bedded in washleather ... ... Ft. run	8½

PAINTER

		s. d.
Limewhiting : Prepare and two coats on brick ...	Yd. sup.	1 2
Whitening : Prepare and two coats on plaster ...	,,	1 5
Washable distemper: Prepare and two coats on plaster	,,	1 11
Emulsion paints: Prepare and two coats on plaster ...	,,	3 1

Painting with oil colours :	Yd. super 1 *coat*	2 *coats*	3 *coats*
	s. d.	s. d.	s. d.
Prepare and paint on plaster	2 3	4 3	6 4
On Steel :			
Plain surfaces	1 10	3 7	5 5
Roof trusses...	2 4	4 7	6 11
Metal casements divided into squares ...	3 4	6 8	10 0
do. divided into large squares ...	2 7	5 0	7 6
Opening edges ... ... Each	8	1 3	1 10
Small pipe ... ... Yd. run	6	1 0	1 5
Rainwater pipe ... ... ,,	1 0	1 11	2 9
Gutter ... ... ,,	1 4	2 6	3 8

	Knot prime and stop	*Add for each extra coat*
On Woodwork :	s. d.	s. d.
General surfaces ... ... Yd. sup.	2 10	2 3
On work not exceeding 3 in. girth ... Yd. run	4½	3½
Add to last for every additional 3 in. in girth	3½	2½
Sash squares on one side ... ... Doz.	5 6	4 6
Large ,, ,, ,, ... ,,	8 6	8 0
Opening edges ... ... No.	9	8

		s. d.
Oiling Hardwood : Two coats with linseed oil... ...	Yd. sup.	1 4
Creosote : Two coats on woodwork	,,	1 7
Polishing—New Work :		
Staining and wax polishing hardwood	Ft. sup.	1 1
Staining, bodying in and full french polishing on hardwood	,,	2 6
Old Work previously polished :		
Preparing old work and repolishing	,,	1 2
Stripping, preparing and repolishing	,,	3 1
Papering :		
Preparing, sizing and hanging lining paper	per piece	10 7
do. do. Wallpaper, p.c. 10s.	,,	19 8

TRADE MARK

- ✳ As tough as a gloss finish
- ✳ Can be applied coat on coat
- ✳ Dries in 4-6 hours
- ✳ Superb opacity

Sealapore Pigmented Primer

For interior and exterior use

Sealapore provides a safe foundation for over-painting dry alkaline surfaces such as cement rendering, asbestos cement sheets and lime gauged plaster, etc. It is white, with considerable opacity, enabling it to be used as an Undercoating and Priming Paint where a minimum specification is required. Sealapore should always be used whenever alkalinity is suspected, and also for the priming of exterior brick and stone surfaces, etc.

GOODLASS, WALL & CO. LIMITED, CORN EXCHANGE, LIVERPOOL 2 or 179/185 GT. PORTLAND STREET, LONDON W.1.

THE BUILDER CURRENT PRICES

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchant's warehouse will necessarily be higher so as to include the stocking and handling costs involved. It is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

		£	s.	d.
Pit Ballast	per yd.	1	5	5
Pit Sand	"	1	3	8
Washed Sand	"	1	6	9
¾ in. Shingle	"	1	4	3
¾ in. Broken Brick	"	1	0	9
Pan Breeze	"	1	5	0
Fine or Coarse Foamed Slag Aggregate	per ton	3	8	0

2 yds. of fine and 2.6 yds. of coarse per ton.

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

		£	s.	d.
Best British Portland Cement. Standard Specification delivered Charing Cross area.				
8-ton loads and upwards, site	per ton	5	16	0
Below 8 tons down to 4 tons, site	"	6	8	0
Below 4 tons down to 2 tons, site	"	6	12	0
Below 2 tons down to 1 ton, site	"	6	14	0
Rapid-Hardening Cement in 8-ton loads and upwards to site	"	6	6	6
Below 8 tons down to 4 tons, site	"	6	18	6
Below 4 tons down to 2 tons, site	"	7	2	6
Below 2 tons down to 1 ton, site	"	7	4	0
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.				
Sulphate Resisting Cement. 32s. 6d. per ton on ordinary cement prices.				
Red, Buff or Khaki Colocrete in 8-ton lots	"	8	16	0
Other colours according to colour.				
In 4-ton lots from 313s. 3d. to 783s. 3d. per ton.				
White Portland Cement	"	14	0	9
Under 1 ton	per cwt.		17	0
417 Cement (Ultra Rapid Hardening) in 8-ton lots and upwards	per ton	7	8	6
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.				
Cullamix Tyrolean Finish, £11 13s.3d. to £14 8s.3d. (1-ton loads and upwards).				
Ciment Fondu and Lightning Brands High Aluminous cement, 6-ton lots and up	"	15	14	6
Stourbridge Fireclay, 6-ton loads at Railway Depot, London	"	6	19	0
Stourbridge Fireclay, 6-ton loads (London sites)	"	7	12	0
Moler Mortar Powder for Flue Bricks (London sites)	per cwt.	1	6	0

BRICKS

Full Loads

		£	s.	d.
First Hard Stocks	per 1,000	16	19	6
Second Hard Stocks	"	14	18	6
Mild Stocks (Kiln Burnt)	"	11	5	0
Mild Stocks	"	11	0	0

All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.

		£	s.	d.
2½ in. Nominal Fletton Bricks to sites in W.C. district :				
Commons	"	6	12	0
Cellular Commons	"	6	12	0
Keyed do.	"	6	14	0
Rustics	"	8	12	0
Cellular Rustics	"	8	12	0
Single Bullnose Commons	"	8	14	6
Sandfaced	"	9	12	0
Tuscans	"	10	7	0
Saxons	"	10	15	0
Golden Buffs	"	11	2	0
Dapple Light Facings	"	11	9	6
Heather Facings	"	11	5	0
Best Blue Pressed Staffs (London sites)	"	34	0	6
do. Bullnose (London sites)	"	34	19	6
Blue Wire Cuts (London sites)	"	29	19	6
Midhurst Lime Bricks (London sites)	"	11	13	0
Uxbridge Whites (London sites)	"	12	3	6
Special Purpose Sandlime Bricks (London sites)	"	9	2	0
Best Stourbridge Fire Bricks :				
2½ in. (London stations)	"	32	14	0
2½ in. (London sites)	"	33	2	9
3 in. (London stations)	per 1,000	39	4	6
3 in. (London sites)	"	39	15	0
2½ in. Moler Flue Bricks (London sites)	"	31	0	0
2½ in. Machine-made Sandfaced Red Facings (London sites)	"	18	19	0
2½ in. Machine-made Multi Red Facings (London sites)	"	19	4	0
2½ in. Hand-made Sandfaced Red Facings (London sites)	"	20	17	6
2½ in. Hand-made Sandfaced Multi-Colour Facings (London sites)	"	20	17	6
Hand-made Sandfaced Cherry Red Facings, Berkshire district (London sites)	"	21	5	0
Hand-made Sandfaced Multi-Colour Facings, Berkshire district (London sites)	"	21	5	0
Rubber Bricks for gauged arches (London sites)	"	52	5	0
2½ in. Surrey Clamp Burnt Multi Stock Facings (London sites)	"	16	15	0
2½ in. Surrey Kiln Burnt Multi Stock Facings (London sites)	"	18	7	6
Glazed Bricks (London sites), White, Ivory, Brown:				
Stretchers	"	64	0	0
Headers	"	63	0	0
Quoins, Bullnose and 4½ in. Flats	"	80	0	0
Double Stretchers	"	85	0	0
Double Headers	"	77	10	0
One side and two ends	"	87	0	0
Two sides and one end	"	89	10	0
Splays and Squints	"	83	0	0

Cream and Buff, £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 47½% for Best quality and plus 47½% less 10% for Second quality.

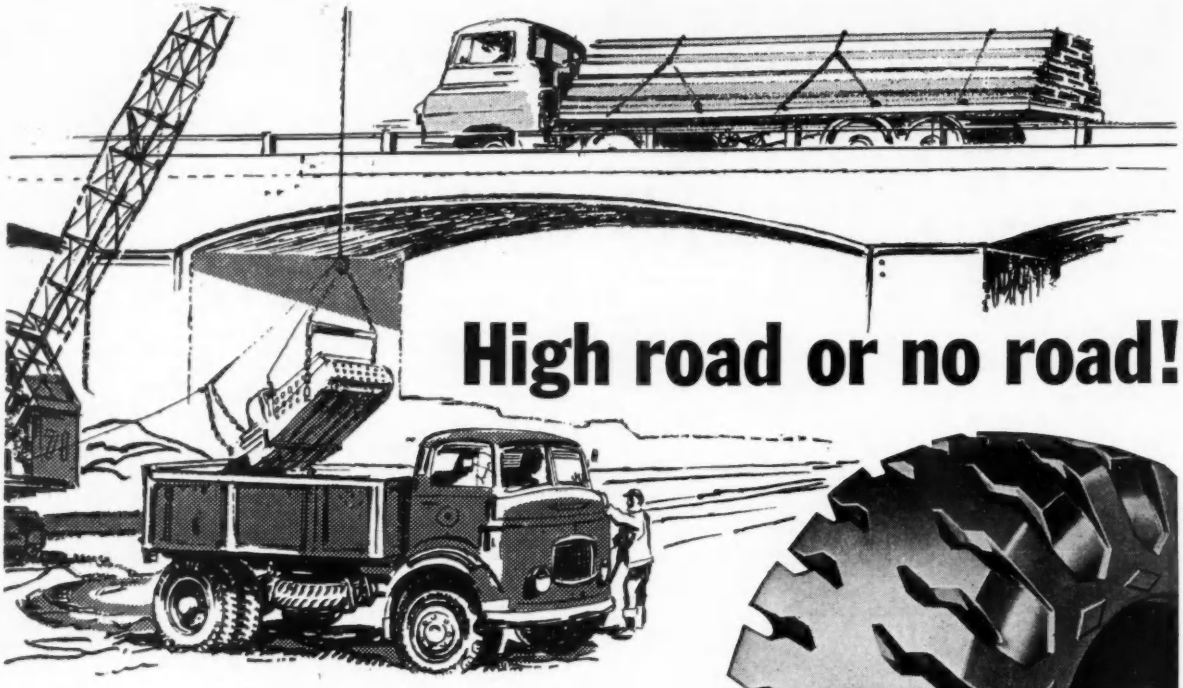
PARTITION SLABS, etc.

Delivered Central London Area. (W.C. District).

		£	s.	d.
HOLLOW CLAY PARTITION BLOCKS (Keyed) Minimum lorry loads				
*2½ in. 140 yds.	per yd. sup.		4	7
BUILDING BLOCKS (Keyed)				
*3 in. (6 cavity) 110 yds.	"		5	9
*4 in. (6 cavity) 90 yds.	"		7	3
6 in. (8½ in. × 5½ in.) 1,250 blocks	per 1,000	28	9	0

* Half blocks at no extra charge.

CLINKER CONCRETE				
2 in. 100 yds.	per yd. sup.		4	0
2½ in. 85 yds.	"		4	7
3 in. 75 yds.	"		5	8
4 in. 55 yds.	"		7	0
CRANHAM TERRA COTTA				
2 in.	"		7	5
2½ in.	"		8	4
3 in. Load bearing quality	"		9	6
4 in. do. do	"		11	6
MOLER PARTITION BLOCKS				
2 in. 150 yds.	"		12	9
2½ in. 120 yds.	"		13	9
3 in. 100 yds.	"		14	9
4 in. 90 yds.	"		17	0
LIGHTWEIGHT CONCRETE BUILDING AND PARTITION BLOCKS OF VARIOUS SOURCES OF MANUFACTURE				
2 in. 100 yds.	per yd. sup.		5	4
2½ in. 80 yds.	"		6	5
3 in. 65 yds.	"		7	5
4 in. 50 yds.	"		9	4
4½ in. 44 yds.	"		10	2
6 in. 33 yds.	"		14	5
THERMALITE-YTONG PARTITION BLOCKS				
2½ in. 144 yds.	"		7	0
THERMALITE-YTONG LOAD-BEARING INSULATING BLOCKS				
3 in. 120 yds.	per yd. sup.		8	5
4 in. 90 yds.	"		11	0
5 in. 72 yds.	"		13	9
6 in. 60 yds.	"		16	6
8½ in. 42 yds.	"	1	3	8
FLOOR BLOCKS AND FILLER TILES				
Floor Blocks 12 in. × 12 in. delivered in full lorry-loads :				
3 in.	per 1,000	35	14	0
4 in.	"	38	9	0
5 in.	"	46	1	0
6 in.	"	52	12	0
7 in.	"	64	12	0
8 in.	"	75	9	0
9 in.	"	83	2	0
10 in.	"	92	0	0
Filler Tiles in multiples of 10 tiles per 1,000 multiples :				
12 in. × 3 in. × ¾ in.	"	43	13	0
12 in. × 4 in. × ¾ in.	"	75	7	0
10 in. × 5 in. × ¾ in.	"	75	7	0



High road or no road!

It's the NEW

SUPER ROAD LUG

for high speed on the highway —more pull in the rough

This super-tough tyre gives you these important advantages:

More Mileage. Wider centre rib has up to 40% more non-skid tread rubber than ordinary tyre.

More Traction. Wider, deeper grooves and sharply angled lugs provide sure traction anywhere.

More Even Wear. Extended lugs put more rubber on the road.

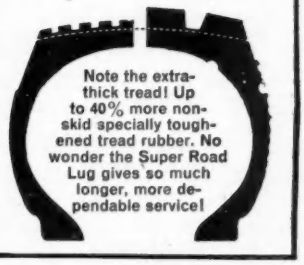
Self-Cleaning Action. Sharply tapered lugs keep tread from clogging.

Improved Twinning Operation. Bolder shoulder lugs offer improved resistance to trapping between twin rear tyres.

Triple-Tough 3-T Cord Body. Gives greater stamina and more remoulds.

WHY SUPER ROAD LUG KEEPS ON GOING

ORDINARY TREAD DEPTH ▼ SUPER ROAD LUG TREAD DEPTH ▼



Note the extra-thick tread! Up to 40% more non-skid specially toughened tread rubber. No wonder the Super Road Lug gives so much longer, more dependable service!

GOODYEAR

THE WORLD OVER, MORE TONS ARE HAULED ON GOODYEAR TYRES THAN ON ANY OTHER MAKE

STONEWARE DRAIN PIPES, etc.

Glazed Stoneware Standard List (November, 1956).

		4 in.	6 in.	9 in.
Pipes, 2 ft. lengths	per ft.	1/8	2/6	4/6
Bends	each	5/–	7/6	20/3
Junctions	„	8/4	12/6	27/–
Gullies with 4 in. outlets	„	12/6	13/9	22/6

The following are the percentages to be added to the Standard List (November, 1956) prices delivered London Area.
Delivered ex Merchants Wharf or Depot.

	Over 2 tons	Over 100 pieces Under 2 tons	Under 100 pieces Under 2 tons
Best Quality ...	NET	+22½%	+27½%
BSS Best Quality...	+10 % NET	+10 %+22½%	+10 %+27½%
Tested Quality ...	+37½% NET	+37½%+22½%	+37½%+27½%
BSS Tested Quality	+47½% NET	+47½%+22½%	+47½%+27½%

		£	s.	d.
3 in. Land Drain Pipes (in 12 in. lengths)	per 1,000	12	10	6
4 in. do. do.	„	16	16	0
6 in. do. do.	„	34	10	0
9 in. do. do.	„	64	19	0

DAMP COURSE

		£	s.	d.
Hessian base bitumen 7 lb. per yd. sup. in 24 ft. rolls cut to wall widths in lots of £6 value and over delivered London area	per yd. sup.		3	5
Asbestos base do. 7 lb. per yd. sup.	do. do.		5	2
Lead lined bitumen do. 9½ lb. per yd. sup.	do. do.		12	2
18 in. × 9 in. British damp course slates	per 1,000	43	8	11
14 in. × 9 in. do. do.	„	32	8	2
9 in. × 9 in. do. do.	„	18	18	9
18 in. × 4½ in. do. do.	„	19	19	9
14 in. × 4½ in. do. do.	„	15	18	3
9 in. × 4½ in. do. do.	„	10	14	3

STONE

		£	s.	d.
Bath Stone				
Monks Park	per ft. cube		10	3
St. Aldhelm Box Ground	„		11	6
Delivered in railway trucks at South Lambeth B.R. Western Region.				
Doulting Stone Random Blocks. Delivered London area	„		10	10
Beer Stone. Delivered London area	„		10	6
Portland Stone—				
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region	„		9	10
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.				
9 in. × 3 in. Rubbed, weathered, throated and stolled cills	per ft. cube	4	5	10
12 in. × 6 in. do. do. do.	„	3	1	2
12 in. × 3 in. Plain coping, twice throated	„	2	7	6
12 in × 3 in. Weathered and twice throated coping	„	3	3	3
14 in. × 6 in. do. do. do.	„	2	17	0
4½ in. × 9 in. Plinth rubbed on top and face	„	2	11	0
3 in. sawn two sides Slabs, random sizes	per ft. sup.		9	1
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ...	per ft. cube	1	11	3
do. do. fair one edge for fair faced brickwork	„	1	17	0
Hard York—				
12 in. × 2 in. Square Steps, rubbed on top and edge	per ft. run		11	0
14 in. × 3 in. Round-nosed Steps, rubbed on top and front	per ft. cube	2	18	3
12 in. × 6 in. Plain Steps, rubbed top and front ...	„	2	11	0
2 in. Rubbed and Jointed Paving, given sizes ...	per ft. sup.		10	3
2 in. Sawn Paving, edges squared, in random sizes	per yd. sup.	3	12	0

TILES AND PANTILES

Delivered London area by road in 6 tons or over per 1,000.

	£	s.	d.
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	35	16	6
Hand-made Pantiles Berkshire district	64	10	0
Hand-made Double Roman Bridgwater district	78	2	9
Hand-made 10½ × 6½ tiles Berkshire district	18	0	0
Machine-made 10½ × 6½ Staffordshire district	17	0	0
Hand-made Hip and Valley tiles per doz.	1	13	0
Machine-made Hip and Valley tiles do.	1	12	0
Concrete tiles 10½ × 6½	8	10	0
do. Interlocking (49S)	19	16	6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate station. Per 1,000 actual.

	£	s.	d.
24 × 12	160	4	0
22 × 12	126	15	0
22 × 11	114	15	0
20 × 12	107	5	0
20 × 10	105	0	0
18 × 10	71	5	0
18 × 9	62	14	0
16 × 10	54	15	0
16 × 8	42	18	0

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

		Ex		£	s.	d.
Softwood			per			
Joinery quality		Wharf	standard	£115 to £140		
Carcassing quality		do.	„	£94 — £98		
1 in. Tongued and Grooved Flooring		do.	„	£112	0	0
Hardwood				£	s.	d.
Mahogany—African S.E.		do.	per ft. cube	1	17	6
do. Honduras S.E.		do.	„	3	5	0
Oak European S.E.		do.	„	2	10	0
do. Japanese S.E.		do.	„	3	0	0
do. English Logs sawn ...		do.	„	2	0	0
Teak 8 in. average S.E. ...		do.	„	3	17	6
Walnut African Logs sawn ...		do.	„	1	2	6
Plywood			per			
6 mm. (¼ in.) Birch Plywood B/BB			100 sq. ft.	4	3	6
6 mm. Israeli Gaboon do. B/BB exterior grade WBP (AX100)			„	4	5	3
18 mm. Birch Blockboard			„	9	7	0
¾ in. Douglas Fir Plywood 96 in. × 48 in. Exterior grade WPB (AX100) solid two sides			„	9	3	0

DOORS (in Lots 1-11)

		£	s.	d.
Delivered London area.				
1¼ in. 4 Horizontal Panel. Pattern 4 in. deal				
2 ft. 0 in. × 6 ft. 6 in.	each	1	16	0
2 ft. 3 in. × 6 ft. 6 in.	„	1	17	6
2 ft. 6 in. × 6 ft. 6 in.	„	1	18	6
2 ft. 9 in. × 6 ft. 6 in.	„	2	0	6
2 in. do. but top panel open. Pattern 4 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	„	2	9	0
2 ft. 9 in. × 6 ft. 6 in.	„	2	11	6
2 in. 2 Panel top panel open. Pattern 2 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	„	2	3	0
2 ft. 9 in. × 6 ft. 6 in.	„	2	5	0
1¾ in. Plywood Faced Flush Doors to BS459, Part 2A				
2 ft. 0 in. × 6 ft. 6 in.	„	1	12	3
2 ft. 0 in. × 6 ft. 6 in.	„	1	12	3
2 ft. 3 in. × 6 ft. 6 in.	„	1	13	9
2 ft. 6 in. × 6 ft. 6 in.	„	1	15	3
2 ft. 9 in. × 6 ft. 6 in.	„	1	18	0
1¾ in. Hardboard Faced Flush Doors				
2 ft. 0 in. × 6 ft. 0 in.	„	1	5	6
2 ft. 0 in. × 6 ft. 6 in.	„	1	6	0
2 ft. 3 in. × 6 ft. 6 in.	„	1	6	6
2 ft. 6 in. × 6 ft. 6 in.	„	1	8	6
2 ft. 9 in. × 6 ft. 6 in.	„	1	9	6

SUNDRIES

		£	s.	d.
Delivered London area.				
1 in. Wood Wool Slabs 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton)	per yd.		6	2
1½ in. do. (67 yds. to 1 ton)	„		8	0
2 in. do. (52 yds. to 1 ton)	„		9	9½
2½ in. do. (45 yds. to 1 ton)	„		11	3
3 in. do. (39 yds. to 1 ton)	„		12	7½
½ in. imported or home produced insulation Board, quantities over 5,000 sq. ft.	per 100 sq. ft.	2	2	6
¼ in. Hardboard do.	„	1	17	6
5/16 in. do. do.	„	2	4	6
2 in. Compressed Straw Slabs, roofing quality. 6 ft., 8 ft., 9 ft., 10 ft., and 12 ft. × 4 ft.				
50–100 yds.	per yd. sup.		11	4
101–250 yds.	„		10	10
251–750 yds.	„		10	1
Over 750 yds.	„		9	4
2 in. do. for partitions 4d. per yd. cheaper.				
1/16 in. Asbestos Flat Building Sheets...	„		4	3½
⅛ in. do. do. do.	„		6	0
Roofing Felt 1-ply	„		1	9
do. 2-ply	„		2	2½
Best Scotch Glue in slabs	per ¼ cwt.	5	3	9
do. pearl	„	5	3	9
Croid Glue	28 lb.	2	6	0
Impact Adhesive	per gall.	2	12	0
Cut Nails 3 in. (1-ton lots)	per ton	84	10	0
do. 4 in. and up (1-ton lots)	„	81	0	0
Wire Nails 3 in. (4-cwt. lots)	per cwt.	4	2	1
do. 4 in. and up (4-cwt. lots)	„	3	19	3

METALS

STEEL JOIST, ETC.

		£	s.	d.
Basis Joists—				
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in., 12 in. × 6 in., plain cut to lengths delivered London area	per ton	47	15	0
Extra for sizes				
3 in. × 1½ in. 4 in. × 1¾ in.	„	3	10	0
3 in. × 3 in.	„	2	10	0
4 in. × 3 in.	„	2	5	0
10 in. × 4½ in.	„	1	10	0
5 in. × 2½ in. 5 in. × 3 in.	„	1	15	0
4¾ in. × 1¾ in.	„	3	5	0
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ...	„		15	0
6 in. × 3 in. 24 in. × 7½ in.	„	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in.	„	1	5	0
9 in. × 4 in. 10 in. × 5 in.				
12 in. × 5 in. 22 in. × 7 in.	„	1	0	0

METALS—*continued*

				£	s.	d.
9 in. × 7 in.	10 in. × 8 in.	12 in. × 8 in.	per ton		10	0
14 in. × 5½ in.	14 in. × 6 in.	14 in. × 8 in.				
15 in. × 5 in.	15 in. × 6 in.	16 in. × 6 in.				
16 in. × 8 in.	18 in. × 6 in.	18 in. × 7 in.	"		10	0
18 in. × 8 in.	20 in. × 6½ in.	20 in. × 7½ in.				
Steel angles average price			"	48	15	0
Steel tees average price			"	49	15	0
Fabricated work delivered London—						
R.S. Joists cut and fitted...			"	67	19	0
Compound girders			"	72	14	3
Stanchions			"	78	9	9
Compound stanchions			"	83	4	3
In Roof Work—Trusses and Purlins			"	93	19	6
Average prices not for awkward work.						
Angle cleats and ¾ in., ⅞ in. and 1 in. bolts average price London area			per cwt.	5	10	0
Above prices joists etc. increased by 1·1%.						

Ferro-Concrete Bars and Fabric

				£	s.	d.
Mild Steel Ferro-Concrete Bars British manufacture to BSS 785 ex. Mills. 1 in. diameter and upwards delivered nearest London station ...			per ton	40	10	0
do. do. ex. London Stock do. delivered London site			"	49	10	0
Extras—						
¾ in. diam....			per ton extra	8	12	6
⅞ in. do.			"	6	12	6
1 in. do.			"	4	12	6
1¼ in. do.			"	3	2	6
1½ in. do.			"	1	10	0
¾ in. and ⅞ in. diam.			"		15	0
Above prices mild steel bars increased by 1·1%.						
Steel wire mesh reinforcing fabric to BSS 1221A.						
Ref. No. 106 ... ... 7.88 lbs.			per sq. yd.		5	2½
" " 109 ... ... 4.71 "			"		3	0½
" " 113 ... ... 1.83 "			"		1	8½
" " 122 ... ... 7.32 "			"		4	10½
" " 125 ... ... 4.32 "			"		2	10½

Mild Steel Tubes

Tubes to BSS 1387. Fittings BSS 1740.

Basic List Prices

		¼ in.	⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Tubes	per ft.	9½	10	1/-	1/2½	1/9	2/3	2/8	3/9
Bends	each	1/7	1/9	2/-	2/6	3/8	5/5	6/2	10/7
Elbows, square	"	1/8	1/10	2/2	2/6	3/-	4/4	5/2	8/6
do. round	"	1/10	2/-	2/4	2/10	3/4	4/8	5/8	9/4
Tees	"	2/-	2/2	2/6	3/2	3/8	5/-	6/2	10/2
Crosses... ...	"	4/4	4/8	5/6	6/6	8/2	11/-	13/2	21/-
Sockets, Plain	"	6	6	8	10	1/-	1/4	1/9	2/6
do. Diminished	"	8	10	1/-	1/2	1/6	2/-	2/8	4/-
Backnuts ...	"	4	4	6	7	10	1/-	1/4	2/2

Malleable Fittings

		¼ in.	⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Elbows, round	each	8½	8½	9½	1/2½	1/8½	2/7½	3/6	5/-
Tees	"	9½	9½	1/-	1/4½	2/-	2/9½	4/-	5/6
Crosses... ...	"	1/2½	1/2½	1/4½	2/-	2/9½	3/7½	5/2½	7/2½
Sockets... ...	"	5½	5½	7	9½	1/-	1/7½	2/2½	3/1½
Backnuts ...	"	3	3	3½	4½	5½	7½	10½	1/5½

Discounts from List prices as follows :—

Galvanised Tube—	Under 1 ton	Over 1 ton	W.I. Fittings	Malleable Fittings
Light	−37 %	−38½%	Light −24½%	Malleable List
Medium	−33 %	−34½%	Heavy −20½%	−14%+40%
Heavy	−25½%	−27 %		
Black—				
Light	−47 %	−48½%	Light −30½%	Malleable List
Medium	−43 %	−44½%	Heavy −26½%	−14%
Heavy	−35½%	−37 %		

C.I. Half-Round Gutters

Delivered London per yd. in 6 ft. lengths.

	Gutters	Nozzles	Stop Ends
3 in.	4/4½	3/10	1/1
3½ in.	4/9	4/2	1/1
4 in.	6/1½	4/9	1/8
4½ in.	6/9	5/4	2/-
5 in.	7/6	5/9	2/4

C.I.O.G. Gutters

Per yd. in 6 ft. lengths :	Gutters	Nozzles	Stop Ends
3 in.	5/7½	5/1	1/4
3½ in.	6/3½	5/1	1/8
4 in.	6/11½	5/4	2/-
4½ in.	7/6	6/1	2/4
5 in.	8/2½	7/-	2/8

C.I. Rain-Water Pipes

	Pipes	Bends	Branches
2 in.	9/4	4/9	6/10
2½ in.	9/4	5/4	9/2
3 in.	10/6	6/8	9/11
3½ in.	11/10	7/10	11/11
4 in.	13/9½	9/6	14/2

L.C.C. Coated Soil Pipes

2 in.	10/7	8/2	9/11
2½ in.	11/2	9/1	12/4
3 in.	12/6½	9/11	14/8
3½ in.	14/-½	12/4	17/1
4 in.	15/11½	13/10	20/3

Above prices for gutters, rain-water and soil pipes for under 5-cwt. lots only. Lots over 5 cwt. see List No. 3300, dated February 1, 1955, plus 32½% and tonnage allowance. 4-ton lots 5%. 2-ton lots 2½%.

L.C.C. Coated Drain Pipes

		£	s.	d.
4 in. diameter in 9 ft. lengths	per yd. run	1	11	1
6 in. do. do.	"	2	5	6
4 in. diameter bends	each	1	0	6
6 in. do. do.	"	2	14	9
4 in. diameter branches	"	1	16	6
6 in. do. do.	"	4	7	6

Above prices for any quantity but under 5 cwt. carriage extra.

Pitch Fibre Drain Pipes

		£	s.	d.
2 in. diameter in 5 ft., 5 ft. 6 in. or 8 ft. lengths including couplings	per ft. run		1	6½
3 in. do.	"		1	10½
4 in. do.	"		2	6
5 in. do.	"		4	1½
6 in. do.	"		5	0½
4 in. diameter short radius ¼ bends	each		17	9
4 in. do. do. ⅛ bends	"		12	11
2 in. diameter 6 ft. radius bends (5 ft. lengths)	"		17	0
3 in. do. do. do.	"		19	8
4 in. do. do. do.	"	1	7	4
5 in. do. do. do.	"	2	4	0
6 in. do. do. do.	"	2	14	6

Above prices for loads of £60 and over.
Loads £25 to £59 19s. 11d. Plus 10%
Loads under £25 ... Plus 15%

Asbestos Rain-Water Pipes and Fittings

All less 17½% discount.

		2 in.	2½ in.	3 in.	4 in.
Pipes, 6 ft. lengths ...	per yd.	4/7	4/10½	5/11	7/10
Shoes	each	3/-	3/3	3/10	5/2
Single Branches	"	4/8	5/6	6/7	9/2
Bends, squares or obtuse ...	"	3/3	3/7	4/8	6/7
Swan Necks, 4½ in. proj....	"	3/7	4/8	5/2	7/3
do. 6 in. do. ...	"	3/10	5/2	5/10	7/10

Asbestos O.G. Gutters and Fittings

		4 in.	4½ in.	5 in.	6 in.
Gutters, 6 ft. lengths ...	per yd.	4/4	4/9½	5/9	6/10½
Drop ends	each	3/6	4/-	4/9	5/5
Stop ends	"	1/1	1/2	1/3	1/5
Angles	"	3/7	4/1	5/-	5/10
Nozzles	"	3/6	4/-	4/9	5/-
Union Clips	"	1/9	2/1	2/6	2/11

Asbestos Half-Round Gutters and Fittings

	per	3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters, 6 ft. lengths	yd.	3/0½	3/7½	3/8½	4/4½	6/1
Drop ends	each	2/6	3/-	3/3	3/7	5/2
Stop ends	"	1/-	1/1	1/2	1/3	1/5
Angles	"	2/10	3/3	3/7	3/10	5/2
Nozzles	"	2/6	3/-	3/3	3/7	5/2
Union Clips ...	"	1/3	1/4	1/5	1/7	2/5

	Per ton basis in London £	s.	d.
Iron—Staffordshire Crown Merchant Quality	52	17	6
Mild Steel Bars	47	18	0
Mild Steel Hoops	49	10	0

	Ex Merchant's Stock per ton Two-ton lots £	s.	d.
Soft Sheets C.R. and C.A.—			
20 gauge	63	0	0
24 gauge	65	10	6
26 gauge	68	11	0
Galvanised Corrugated Sheets, 6-ft. to 9-ft.—			
20 gauge	70	18	0
24 gauge	74	9	0
26 gauge	79	15	0
Galvanised Flat Sheets C.R. and C.A.—			
20 gauge	72	8	6
24 gauge	75	19	0
26 gauge	81	5	0

ALUMINIUM AND ALUMINIUM ALLOYS

(Base Prices)		£	s.	d.
Sheet BS 1740 S1C 18 SWG (36 in. wide)... ...	per lb.		3	0½
Sheet BS 1470 NS3 Utility 18 SWG (36 in. wide)	"		2	11½
Coiled strip BS 1470 S1C 18 SWG (24 in. wide)	"		2	11½
Coiled strip BS 1470 NS3 Utility 18 SWG (24 in. wide)...	"		2	11
Coiled strip high purity, 22 SWG (12 in. wide)	"		3	2
Corrugated sheet BS 1470 NS3 Circular Profile 8 ft. × 32 in. × 20 SWG	per sheet	1	14	1
Corrugated sheet BS 1470 NS3 Industrial Profile 8 ft. × 31½ in. × 20 SWG	"	1	19	10
Corrugated sheet BS 1470 NS3 Mansard Profile 8 ft. × 31½ in. × 20 SWG	"	1	13	1
Extruded section BS 1476 E1C simple moulding	per lb.		2	10½
Extruded section BS 1476 E1C 1 in. diam. round	"		2	8
Extruded section BS 1476 HE19WP simple angle	"		3	2
Extruded section BS 1476 HE19WP 1 in. diam. round	"		3	1
Tubing BS 1471 T1C 1½ in. O/D × 20 SWG ...	"		4	8
Tubing BS 1471 HT19WP 1½ in. O/D × 20 SWG	"		6	3

PLUMBERS' BRASS WORK, etc.

Delivered in London area.

All per dozen	B.S.S. ¼ in.	⅜ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron...	87/-	128/-	—	—	—	—
Toilet bib cocks for iron ...	109/-	158/5	—	—	—	—

PLUMBERS' BRASS WORK, etc.—*continued*

All per dozen	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown stopcocks for iron	66/-	95/9	188/-	363/-	522/6	917/6
do. with two unions for lead	89/-	132/-	234/4	472/-	623/6	1,389/6
Double nut boiler screws ...	18/8	26/5	47/6	48/6	67/-	93/6
Heavy Croydon ball valves	77/-	193/6	312/5	568/8	734/10	—
Plumbers' union brass lead to iron	19/6	23/6	38/6	52/10	70/6	165/-
	1½ in.	1¾ in.	2 in.	3 in.	3½ in.	4 in.
Caps and Screws	33/-	40/8	59/6	92/5	118/10	155/3
Brass Sleeves	—	31/11	31/11	56/2	74/10	91/5
	1½×6 lb.	1½×6 lb.	2×7 lb.			3×7 lb.

Lead P. trap with brass cleaning screws 68/6 85/6 137/- 233/9
Lead S. trap do. do. 82/9 102/9 168/3 302/3

Solder :		s.	d.
Plumbers' ...	1 cwt. lots	320/-	14 lb. lots per lb. 3 7
Tinmen's	" "	404/-	" " " 4 5
Blow pipe ...	" "	407/-	" " " 4 6

Copper Tubes and Sheets

Copper tubes BSS 659/1944 on the basic price of 27⅞d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 10 cwt.

	Extra d.		Total per lb. d.		Approx. per ft. d.
¼ in. × 19 gauge	16½		44½		12
⅜ in. × 19 "	14½		42½		16½
1 in. × 18 "	12½		40½		25½
1¼ in. × 18 "	12½		40½		30½
1½ in. × 18 "	12½		40½		36½
2 in. × 17 "	13½		41½		58½

Small Quantity extras :
10 cwts. to 5 cwts. ... ... plus ½d. per lb.
5 cwts. to 2 cwts. ... ... " 1d. "
2 cwts. to 1 cwt. ... ... " 2d. "

Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras ... ... £ 271 s. 10 d. 0

Zinc

		£	s.	d.
Sheet Zinc, 10 gauge (25 SWG),	5 cwt. lots upwards per cwt.	8	6	6
" " 12 gauge (23 SWG),	" " " "	8	4	0
" " 14 gauge (21 SWG),	" " " "	8	2	9

Brass Tube

Brass tubes, basic price, plus gauge and manufacturing extras ... ... per lb. 1 10½

LEAD SHEET AND PIPES

Basis selling price to one address in London or Home Counties :

		£	s	d.
Lead Sheet, English, 3½ lb. substance and upwards	per ton	104	15	0
" Water Pipe, in coils	"	107	0	0
Lead Soil Pipe, 10 ft. or over 2 in. to 4 in. in dia.	"	108	10	0
" " " over 4 in. dia.	"	110	10	0
" Gas or Untinned Compo pipe	"	108	10	0
5 cwt. lots and over less 6d. per cwt. off basic prices.				
Extras over Basis for quantities under 5 cwt. :				
3 cwt. and under 5 cwt.	per cwt.		4	0
1 cwt. do. 3 cwt.	"		6	0

Smaller quantities than 1 cwt. priced specially.
Supplying sheet lead and lead pipes to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.
Allowance for Old Lead, collected, £53 0s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

		£	s.	d.
Coarse Pink in 1-ton loads and over delivered on site	per ton	8	11	3
do. White do. do. do.	"	9	0	9
Sirapite Coarse BSS 1191 Class C do.	"	9	2	9
do. Fine do. do. do.	"	9	10	6
do. Browning BSS 1191 Class B do.	"	9	2	9
do. Board Finish do. do.	"	9	2	9
Blue Lias Lime, in 6-ton loads	"	6	17	6
Hydrated Lime (Grey) in 6-ton loads	"	6	2	0
do. (White) do.	"	6	12	0
Lump Lime (Grey) do.	"	5	19	0
do. (White) do.	"	6	6	6
White Keen's or Parian Cement, in 1-ton loads ...	"	12	7	6
Pink Keen's or Parian Cement, in 1-ton loads ...	"	12	2	3
Granite Chips, in 6-ton loads	"	2	6	9
Hair	per cwt.	4	17	6
Gypsum Plaster Lath or Base Board, ½ in. thick, 600 yds. and over in one delivery. Delivered site	per yd.		2	2½
1,200 yds.	"		2	1½
do. Insulating do. ½ in. thick, 600 yds. and over in one delivery. Delivered site	"		2	8
1,200 yds.	"		2	7
Gypsum Plaster Wall Boards, 3 and 4 ft. wide 6 to 12 ft., ½ in. thick, 600 yds. and over in one delivery. Delivered site	"		2	5½
1,200 yds.	"		2	4½
do. Insulating do. ½ in. thick, 600 yds. and over in one delivery. Delivered site	"		2	11
1,200 yds.	"		2	10

PAINTS AND DISTEMPER

Delivered London area.		£	s.	d.
Ceiling Distemper	per cwt.	1	7	6
Washable Distemper	"	5	18	0
Gloss Paint	per gal.	2	18	0
Super Snowcem cement paint (in 1 cwt. drums) ...	per cwt.	5	0	0

Lead Products and Oils

		£	s.	d.
Ground White Lead, in 1 cwt. kegs	per cwt.	8	7	6
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins	per gal.	3	6	6
Genuine Red Lead, Dry, (1 cwt. lots)	per cwt.	6	17	0
Genuine Linseed Oil Putty, 1 cwt. keg	"	2	13	6
Size XD quality 28 lb.	per tin		9	0
Raw Linseed Oil (5 gal.) drums extra	per gal.		16	9
Boiled Linseed Oil (5 gal.) do.	"		17	8

Sundries

Turpentine substitute (5 gal.) drums extra ...	"		5	4½
do. do. (40 gal.) do.	"		4	8½
Solignum, Brown (5 gal. cans) Exterior ...	"		10	0
Creosote (40 gal. barrels)	"		2	3
Paste Powder (1 lb. packets)	per lb.		2	4
White Lining Paper	per piece		1	4

VARNISHES, etc.

Delivered London area.		£	s.	d.
Oak Varnish, Outside or Inside	per gal.	2	0	0
Oak, Pale Copal do. do.	"	2	0	0
Hard Drying Oak for Inside	"	2	5	0
Crystal Paper Varnish do.	"	2	8	0
Eggshell Flat Varnish do.	"	2	2	0
Finest Carriage Varnish	"	2	7	0
Front Door Varnish	"	2	4	0
Japan Gold Size	"	1	12	0
Black Japan	"	1	16	0
Brunswick Black	"	1	12	0
Berlin Black	"	1	10	0
Terebene	"	1	12	0
Knotting (1 gal. bottles free)	"	1	15	0
French and Brush Polish (do.)	"	1	15	0

GLASS

Delivered London area.		s.	d.
18 oz. Sheet Glass Ordinary Glazing Quality— Cut Sizes	per ft. sup.		10
24 oz. do. do. do. do.	"	1	0½
26 oz. do. do. do. do.	"	1	3
32 oz. do. do. do. do.	"	1	7½
¼ in. Rolled Plate	"	1	3½
¼ in. Rolled and Rough Cast	"	1	6½
¼ in. do. do.	"	1	7½
¼ in. Figured Rolled and Cathedral, Standard patterns—			
White Group 1	"	1	3½
do. Group 2	"	1	9½
do. Standard Tints	"	2	1½
do. Special Tints	"	7	3
¼ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating Group 3	"	1	8½
¼ in. Wired Cast up to 50 in.	"	1	10½
¼ in. do. do. 50 in. to 72 in.	"	2	2½
¼ in. Georgian Wired Cast	"	1	11

Hollow Glass Blocks—

P.B.2	Cross reeded	5¾×5¾×3⅞ in.	each	3 9
P.B.3	Broad reeded	7¾×7¾×3⅞ in.	"	5 9
P.B.32	Cross reeded	7¾×7¾×3⅞ in.	"	5 9
P.B.4	Prismatic	7¾×7¾×3⅞ in.	"	6 6
P.B.5	Flemish	7¾×7¾×3⅞ in.	"	5 9
P.B.6	Boomerang	7¾×7¾×3⅞ in.	"	6 6

Half Size Blocks—

P.B.32	Cross reeded	7¾×3¾×3⅞ in.	"	4 10

Radiused Corner Blocks to match up with—

P.B.2	Cross reeded	"	8	1
P.B.3	Broad reeded	"	9	8
P.B.32	Cross reeded	"	9	8

P.B.2, P.B.3, P.B.32 are also supplied in Light Diffusing Blocks at same price.

¼ in. Polished Plate Glass, G.G. quality—				
In plates not exceeding 2 ft. sup.	per ft. sup.	4	7	
" " " 5 ft. sup.	"	5	7	
" " " 45 ft. sup.	"	7	6	
" " " 100 ft. sup.	"	7	6	
¼ in. Polished Plate, extra sizes, i.e., plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality—Not exceeding 135 ft. sup. or 240 in. one way or 130 in. both ways ...	"	11	4	
Not exceeding 180 ft. sup. or do.	"	15	0	

Plates exceeding 180 ft. sup. prices on application.
Substances other than ¼ in. Polished Plate at Special Prices.
Quantity Tariff—Sheet and Sundry Glass.
The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass—	Minimum quantity	per ft. sup. s.	d.
18 oz. sheet O.Q.	3,000		7½
24 oz. " "	2,000		9½
26 oz. " "	2,000		11½
32 oz. " "	2,000	1	3½
¼ in. Rolled Plate	1,000		10½
¼ in. Figured Rolled and Cathedral Standard Patterns, White Group 1	1,000		10½
do. Group 2	1,000	1	2½
¼ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte Group 3	1,000	1	2½
¼ in. Rolled Plate or Rough Cast	2,000	1	2
¼ in. do. do.	2,000	1	2½
¼ in. Wired Cast, Hexagonal up to 50 in. ...	2,000	1	5
¼ in. do. do. do 50 in. to 72 in. ...	2,000	1	9
¼ in. Georgian Wired Cast	2,000	1	5½

THE BUILDER RATES OF WAGES

AS FROM FEBRUARY 6th., 1961. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors)

1. Craftsmen and Labourers.

Region	Craftsmen	Labourers
	s. d.	s. d.
England & Wales (Grade A) ...	5 0	4 4½
London	5 1½	4 6
Liverpool and District ...	5 1½	4 6
Scotland... ...	5 0	4 4½

2. Apprentices.

Age	Per cent. of Craft Rate	London and Liverpool Dist.	England, Wales
		s. d.	s. d.
15	25	1 3½	1 3
16	33½	1 8½	1 8
17	50	2 6½	2 6
18	62½	3 2½	3 1½
19	75	3 10½	3 9
20	87½	4 6	4 4½

3. Young Male Labourers.

Age	Per cent. of Craft Rate	London and Liverpool Dist.	England, Wales and Scotland
		s. d.	s. d.
15	33½	1 6	1 5½
16	45	2 0½	1 11½
17	66⅔	3 0	2 11
18	100	4 6	4 4½

NORTHERN IRELAND is not included; rates fluctuate so much from district to district that reference should be made to local offices.
WATCHMEN.—The rates per shift for watchmen engaged on building sites is 27s. 6d. in London and Liverpool District, and 26s. 3d. in the provinces.
FEMALE OPERATIVES.—In all districts throughout the country except in Scotland the rate of wages for women, aged 19 and over, engaged in craft processes is 4s. 1½d. per hour. Women engaged on work other than craft processes, 3s. 9½d. per hour. In Scotland the rate for the woman craftsman is 4s. 4½d. after a probationary period, and the woman labourer, 3s. 10½d.

New Companies

THE FOLLOWING NEW COMPANIES, registered in England, have been announced by Jordan and Sons, Ltd., company registration agents.

E. A. FAZACKERLEY (PRESTON) LTD.—Regd. August 29, 1961, Oxheys-st., Preston. Secy.: E. A. Fazackerley. Bldrs., etc. Nom. cap.: £2,000.

S. E. C. CONSTRUCTION CO. LTD.—Regd. August 29, 1961. Burton-chmbrs., King-st., Carmarthen. Nom. cap.: £1,000. Perm. dir.: Thomas J. W. Jones-Sandell, The Poplars, Whitemill, Carmarthenshire.

BERNARD C. AUSTIN & SON LTD.—Regd. August 29, 1961. Bldrs., etc. Nom. cap.: £1,000. Sub.: Bernard C. Austin, 34 Bedonwell-rd., Bexleyheath.

RAINES CONSTRUCTION & DEVELOPMENT CO. LTD.—Regd. August 29, 1961. Nom. cap.: £100. Sub.: M. C. Leftwich, 5 Glenn Court, Glenn-ave., Purley, Surrey.

BROOKLEY BUILDING CO. LTD.—Regd. August 29, 1961. 149 Sandringham-rd., Watford, Herts. Secy.: P. H. Adkins. Nom. cap.: £1,000.

E. WHITEHOUSE & CO. (WILLENHALL) LTD.—Regd. August 30, 1961. 48 Stafford-st., Willenhall, Staffs. Secy.: E. Clifford. Bldrs.' brass and bronze fndrs., etc. Nom. cap.: £1,000.

E. J. ELLIS & CO. LTD.—Regd. August 30, 1961. 7 St. Johns Hill, Clapham Junction, SW11. Secy.: E. J. Ellis. Bldrs., decrs., etc. Nom. cap.: £500.

A. COLLINS (KENTON) LTD.—Regd. August 30, 1961. 152 Christchurch-ave., Kenton, Harrow, Middx. Secy.: R. F. Edwards. Bldr., decr. and contr., etc. Nom. cap.: £1,000.

VANGUARD CONSTRUCTION LTD.—Regd. August 30, 1961. Bldrs., etc. Nom. cap.: £300. Sub.: Matthew Gibb, 14 Grays Inn-sq., WC1 (solr.).

C. & H. BUILDERS (HARROW WEALD) LTD.—Regd. August 30, 1961. 58 Long Elmes, Harrow Weald, Middx. Secy.: D. J. Catlin. Nom. cap.: £100.

FLINT & ACUTT CO. LTD.—Regd. August 30, 1961. 54 Queensway, W2. Secy.: T. W. Flint. Bldrs., etc. Nom. cap.: £100. Sub.: Thomas W. Flint, 14 St. Lukes-ave., SW4.

WILLIAM WHITTON & SON LTD.—Regd. August 30, 1961. 1a Jaxons-cmbrs., Hallgate, Wigan. Secy.: Gwendolene B. L. Cannell. Bldrs., etc. Nom. cap.: £1,000.

WILLIAM MONKS (LONGRIDGE) LTD.—Regd. August 30, 1961. 15 Cross-st., Preston, Lancs. Secy.: A. Harper. Bldrs. and decrs., etc. Nom. cap.: £5,000.

SYDNEY (BUILDERS) LTD.—Regd. August 31, 1961. 10 The Earls Croft, Cheylesmore, Coventry. Secy.: S. N. Long. Nom. cap.: £100.

R. GEORGE LTD.—Regd. Sept. 1, 1961. 83-85 St. Mary-rd., Walthamstow, E17. Secy.: F. H. Eiles. Bldrs., building contractors, etc. Nom. cap.: £500.

R. KIRBY & SONS LTD.—Regd. Sept. 4, 1961. 1 Pontefract-la., Leeds 9. Secy.: R. S. Kirby. Bldrs., etc. Nom. cap.: £1,000

HEMMINGS & KENT LTD.—Regd. Sept.4, 1961. Ambrose-st., off Moss-la., Leyland, Lancs. Secy.: F. J. Saul. Bldrs., etc. Nom. cap.: £2,000.

H. T. WATKINS (NEWBRIDGE) LTD.—Regd. Sept. 4, 1961. Cwmdws, Newbridge, Mon. Secy.: J. K. Pollitt. Blds. & contractors cd on at Newbridge, Mon. Nom. cap.: £40,000.

E. R. DICKINSON & SON LTD.—Regd. Sept. 4, 1961. 42 Sitwell Way, Port Talbot. Secy.: E. R. Dickinson. Bldg. contractors cd on at Port Talbot. Nom. cap.: £500.

STREVETT & MITCHELL LTD.—Regd. Sept. 4, 1961. Union-pl., High-st., Crawley, Sussex. Secy.: Joyce E. Pelling. Bldrs. and contrs. carried on by I. M. Mitchell as 'Strevett & Mitchell' at Crawley. Nom. cap.: £100.

CHAS. MITCHELL & SONS (CONTRACTS) LTD.—Regd. Sept. 5, 1961. Secy.: Lilerie H. Newman. Bldrs., etc. Nom. cap.: £1,000.

DAVID LEWIS (ESTATES) LTD.—Regd. Sept. 5, 1961. Office, Maesgwyn, Blanche-st., Williamstown, Rhondda, Glam. Secy.: Elisabeth M. Lewis. Estate developers, etc. Nom. cap.: £1,000.

RUDMAN & SHEEN LTD.—Regd. Sept. 5, 1961. 'Mandaley,' Larkhill-rd., Durrington, Wilts. Secy.: H. J. Collins. Painters, decrs. & bldg. contrs. at Durrington, etc. Nom. cap.: £2,000.

DODD M. BUCKMASTER & CO. LTD.—Regd. Sept. 6, 1961. 58 Robert-ave., St. Albans. Secy.: Mrs. J. G. Buckmaster. Bldrs., etc.

HOWARD BOTTING LTD.—Regd. Sept. 6, 1961. 22 Penn-cres., Haywards Heath, Sussex. Secy.: Miss Audrey M. Howard. Bldrs., etc. Nom. cap.: £1,000.

FRANK CORKER (CONTRACTORS) LTD.—Regd. Sept. 6, 1961. Plumbing & bldg. contrs., etc. Nom. cap.: £5,000. Dir.: Frank Corker, 36 Stradbroke-ave., Sheffield 13.

HAZELDOWN CONSTRUCTION COMPANY (TEIGNMOUTH) LTD.—Regd. Sept. 6, 1961. Nom. cap.: £2,000. Sub.: George H. Gouer, 26 Coronation-ave., Dawlish, S. Devon.

A. & C. BYRD & CO. LTD.—Regd. Sept. 6, 1961. Sicilian-hse., Sicilian-ave., WC1. Secy.: Elsie I. Bryd. Bldrs., etc. Nom. cap.: £100.

Day-Release in Scotland

Consultative Committee on 'Disappointing Results'

THE DISAPPOINTING RESULTS of day-release acceptance in Scotland is indicated by the Scottish Technical Education Consultative Committee which has welcomed the move by the Secretary of State for Scotland to consider 'legislative and other measures which might be adopted' to make day release more generally used. To that end the Council has appointed a committee to co-operate with the Secretary of State in this proposal. The Council is sponsoring an experiment in apprentice training and is also supporting the setting up of the new Scottish Council for Commercial Education. These points are made in the report of the Council for the year ended July, 1961.

Ten Per Cent of Total Attend

Day release figures continue to be disappointing. Only about 10 per cent of the population under 18 years of age is attending part-time day courses. An experimental scheme to be staged in the West of Scotland will involve 40 apprentices who will do three years in full time education and two years in industry. Each apprentice will be sponsored during his full time education by employers who will undertake to employ them at least for their two years in industry, after completion of a three year course. Entrants for this pioneer scheme will be selected by the Committee appointed by the Council, in co-operation with employers. Standard apprentice rates will be paid while the entrants are in full time day training. This scheme is regarded as an experiment which might suggest alternatives to the traditional pattern of apprentice training.

This development is of considerable interest to the building trades where considerable advances have been made in technical education but where the problem of day-release is as severe as in other sections of industry. The experiment now proposed will consequently be watched with a great deal of interest as a possible solution to this problem, although much of the responsibility for effective training of apprentices will continue to fall on individual employers who are urged to make the fullest use of existing facilities, including day release, pending the further evolution of any new system of trade and craft training.

TECHNICAL REVIEW

This Review of plant, equipment and materials—in most cases new or with new features—is intended to give brief details only of the products mentioned. Notices are based on data supplied by the manufacturers. Additional information and prices can be obtained either direct or by using the prepaid Readers' Service form which appears on page 164 of this issue. The form can be used for more than one inquiry.

1. Cranes

The unusual feature of a new CLIMBING CRANE is that the mast is only 40 ft. high. This is because the building being erected is used to raise the crane as construction progresses. Such a method offers certain economies, no heavy foundations, no rail track, no base ballast and no additional tower sections to gain height. Another advantage is that the crane can be worked from ground level by remote control. Load placing is made accurate by means of the Micro speed unit which gives precise control over lowering and lifting.

All electrical gear is situated in weather proof housing, and travelling and slewing are powered by separate motors which can be operated simultaneously or individually. Hoisting speeds are 158 ft. per minute with two lines and 79 ft. per minute with four lines. The change over from two lines to four is a very simple and rapid operation.

C. T. (London), Ltd.,
27 Ashley-place, London, SW1

2. Excavation

A self-propelled HYDRAULIC EXCAVATOR, already widely used on the continent, is now available with more than thirty alternative and interchangeable buckets and grabs for trenching, boring, loading, bulk excavation, skimming, re-handling and face shovel work. It has a penetration force of up to 16 tons, a hydraulic pressure of 3,500 p.s.i. and will excavate bore holes of up to 17 ft. In addition, by means of a new patented hydraulic motor, full circle slewing can be achieved. The machine performs well on bad ground and has a road speed of 10 m.p.h. for inter-site travel, being fitted with a 45 h.p. 4-cylinder diesel engine giving four forward and one reverse speed. The excavator has a turning circle of only 13 ft.

Moore's Plant Ltd.,
Markfield-road, London, N.15

3. Fencing

A new range of CONCRETE FENCING designed to blend with any structure, contemporary or period, has just been introduced. The fencing is of the open type, and no bolting is required, posts being slotted to take panel and frame. Posts are set 18 inches into the ground to give maximum stability. The concrete fencing is available in sections 4 ft. wide x 5 ft. 5 in. tall, with posts measuring 4 in. x 4 in.

Sectional Concrete Buildings Ltd.,
Station Works, Fenny Compton,
Nr. Leamington Spa, Warwicks.

4. Heating

A new GAS FIRE, which provides approximately equal proportions of radiant heat and convected heat, goes a long way to solving the problem of heat loss through chimney suction. It does this by means of a special draught regulator, an automatic damper which is self-regulating to close progressively as the chimney pulls more strongly and to open again as the pull becomes less. The regulator is basically a control flap, constructed wholly of stainless steel to ensure maximum sensitivity and long life. It hangs loosely in front of the mouth of the flue outlet inside the fire. The stronger the chimney pull, the closer the flap is drawn to the mouth of the outlet, so reducing the outlet area and controlling the amount of air drawn, with the products of combustion, into the chimney. The regulator is sensitive to the smallest pressure changes. An additional feature of the fire is a completely automatic thermostat whereby room temperature can be controlled by adjusting a dial with numbered settings up to 70°F. The thermostat is actuated by the temperature of the room air drawn beneath the fire.

Radiation New World Ltd.,
Radiation House, North Circular-road,
London, NW10.

The new model TY45 Poclain hydraulic excavator

5. Lighting Equipment

An interesting feature of a new range of fluorescent lighting fittings is the introduction of a spring mounted LAMPHOLDER. The bi-pin lampholders used are of the type which completely encloses the lamp cap. They are unusual in that they are attached to the fitting by substantial flat strip springs, and consequently the whole lampholder is sprung. Ample movement at the lampholders makes re-lamping very easy, and it has been possible to use a spring which holds the lamp positively, and provides adequate pressure at the electrical contacts.

The hard phosphor bronze spring assemblies normally used within good quality lampholders have been replaced by simple contacts; consequently there is a lower millivolt drop in the circuit which is of assistance to starting. A safety factor of the lampholder is that it is impossible to insert one pin of a bi-pin lamp by mistake.

Ekco-Ensign Electric Ltd.,
45 Essex-street, London, WC2.

6. Miscellaneous

A new WALLBED looks to be fairly useful as a space-saver, particularly where extra accommodation is needed. As the name implies, the bed folds away against the wall and occupies only a very small floor space when in the closed position. It can be hidden out of sight in a cupboard, a wall recess or curtained-off space, and fixing is fairly simple. A useful time-saver—when moved it does not have to be unmade.

Greaves & Thomas Ltd.,
Clapton, London, E5

7. Airfield Services

A SERVICE UNIT has recently been designed to facilitate the supply of essential services, such as electricity, compressed or chilled air, water, telephone, etc., to such places as airport aprons without impeding the movement of aircraft and other vehicles. It consists of a main cover which is designed to fit flush to the ground, beneath which is housed a plug and socket. The cover has an automatic spring opening action which brings the socket to the correct angle for easy insertion of the plug, and releases a cable lay cover securing bolt. Closing the main cover brings the plug and socket back to

horizontal, which in turn makes the plug depress the cable lay flap to form a sloping platform for the cable.

The unit is simple to maintain with no close fitting parts or gaskets liable to wear. It is designed for 415 volt, three phase supply, ranging from 30 to 150 amps and incorporating flame proof equipment. The unit can also be connected for high pressure air supply up to 3,500 p.s.i. All floor level plates and covers are castings of high grade rust resisting meanite, stressed and tested to bear a wheel load of 125 lbs. p.s.i. with a safety factor of 2. Other operating parts are either phosphor bronze or stainless steel.

Industrial Service Outlets Ltd.,
127 High-street, Croydon, Surrey.

8. Lighting

A new LAMP has been designed to operate satisfactorily even where voltage variations may be experienced, so that it remains less affected by the surges which normally lead to short lamp life. The lamps are made in small batches from carefully selected materials of high quality and during manufacture undergo a rigid system of control and inspection. In addition to this, each individual lamp is time-delay tested before despatch. This means that the lamps are allowed to rest for a suitable period and then re-tested, a method that eliminates the risk of early failures which can develop after the more usual type of final test carried out immediately after manufacture.

Crompton Parkinson Ltd.,
Crompton House, Aldwych,
London, WC2.

9. Contractors' Plant

Two new electric HAMMERS, which are replacing existing models, are said to have a 40 per cent faster performance than their predecessors. Both hammers have moisture and vibration proof motors and improved brush gear which more than doubles the brush life. Built-in brush stops prevent damage to the commutator on direct contact with the brush springs. Both hammers can be used very successfully with the Kango automatic drill rotator.

Kango Electric Hammers Ltd.,
Lombard-road, Morden-road,
London, SW19.

The Kango 'L' type drilling concrete

Trade News

New Timber Business

GEORGE E. GRAY, LTD., timber importers and distributors, of Ilford, have announced the formation of a new subsidiary, William Hunter (Essex) Ltd., to meet the specialised demands of the Essex building trade. The subsidiary has its headquarters in Horns-rd., Ilford, and a branch in Southend-rd., Grays, Essex. It will supply softwoods, hardwoods and wallboards, plywoods and other building materials.

Door Frames

BRYCE, WHITE & CO. LTD. announce that their One-Hour Firecheck door frames, to BSS 459 Part 3, can now be supplied from stock at their Paddington branch, 16 South Wharf-rd., W2. This is the first time that these frames have been readily available in the London area where they are principally specified and used.

A 'Package Deal' Escalator

A NEW and somewhat revolutionary method of installing an escalator was carried out on August 30 by Messrs. Marryat & Scott Ltd., the Hounslow, Middlesex, firm of lift and escalator manufacturers. An escalator, absolutely complete with its steps, handrails, outer covering and balustrade, was delivered from the Brunswick-yard, Nine Elms Goods Depot, to Morley's Stores, London, SW9. The escalator, mounted on wheels, was towed through the streets via Nine Elms-lane. On arrival the wheels were removed and the escalator placed in position, after which it was only necessary to clean down and switch on.

Heating Company's Training School

THE HEATING DIVISION of Colt Ventilation Ltd., Surbiton, Surrey, has established a training school at Dorking. The lectures for the weekly courses are given by senior engineers of the company to Colt engineers from abroad as well as from England and also to maintenance staffs of industrial customers.

New Office

THE PLYWOOD MANUFACTURERS ASSOCIATION of British Columbia announces the opening of a new office at 20 North John-street, Liverpool 2. The function of the office will be to promote the increased use of Canadian Douglas Fir plywood. It will also assist architects, contractors and fabricators in the use of fir plywood.

'Fine Floors'

MICHAEL NAIRN & CO. LTD., as part of their export drive, have recently produced a film called 'Fine Floors.' It runs for nearly half an hour during which time something is shown of the more interesting production steps in the making both of linoleum and vinyl floor coverings. Some interesting flooring installations are also shown and brief visits are paid to the Nairn interests overseas.

French, German, Danish, Norwegian, Swedish and Spanish translations of the commentary will be made and the film will be sent to the company's agents and representatives abroad who will show it to architects, flooring contractors, retailers and to others to whom it is of interest. At home, arrangements on a regional basis are already under way and it is hoped that within the next six months the film will be shown at least 200 times covering all parts of the country. Technical schools and specialist groups may borrow the film free of charge by applying to the Public Relations Officer, Michael Nairn & Co. Ltd., Kirkcaldy, Fife.

Price Reductions

FOLLOWING THE RECENT reduction in the price of most Warerite designs, Bakelite Ltd. now announce price cuts in a large range of plain colours. Seventeen plain colour veneers with satin finish have been reduced from 4s. 2d. per sq. ft. to 3s. 5d. whilst plain white is now 3s. 2d. per sq. ft.

New Texture Finish

THE ARBORITE CO. (UK) LTD. announce that a new 'texture finish' for Arborite decorative laminates is now available in this country and can be applied to any of the company's 200 patterns and effects. The new finish is matt, and was introduced earlier this year in the United States, where it has been successful particularly as wall panels. By this new process, plain colours take on a texture which is similar to emulsion paint on good plaster.

Agency Appointments

DENNIS & ROBINSON LTD. of 136 Albion-st., Southwick, Sussex, have been appointed main distributors for Warerite laminated plastics in Sussex and surrounding areas. C. H. JOHNSON (MACHINERY) LTD. have appointed Wheatley & Whiteley, 99 Kirkstall-road, Leeds, 3, as spares and service agents for the Yorkshire Area.

Block Making Machinery

CORNELLY EQUIPMENT CO., LTD., of 39 Victoria-st., London, SW1, announce that they have been appointed European distributors of the American fully automatic block machinery made by the Clanton Corporation. The range includes fully automatic block machines with up to 12 operating cycles per minute giving up to 36 eight in. blocks per minute.

Eire Distributor

E. BOYDELL & CO. LTD., of Manchester, manufacturers of the Muir-Hill range of dumpers, loaders and shunters, have appointed H. W. Lees & Son, Linden, Kill-lane, Foxrock, Co. Dublin, as their sole distributors in Eire.

Change of Name

HILLS PLANT LTD., 12 Burleigh-street, Strand, WC2, and of Reigate, Surrey and Willow Ley, Derby, has changed its name to Aveling-Barford Hire Ltd.

News in Brief

Scheme for Supermarkets

A CHAIN of supermarkets throughout Britain is to be planned by Fine Fare, Ltd., a company with which Mr. Garfield Weston is associated. Several hundred new buildings are contemplated.

Town Development, Merthyr Tydfil

CHESTERFIELD PROPERTIES LTD., have submitted a plan to Merthyr Tydfil borough council for the redevelopment of eight acres of the town's centre. The scheme has been designed by Messrs. Halpern & Associates, 193 Nelson-road, Gillingham, Kent.

Chalk Lime Association Open Day

TWO OPEN DAYS are being held by the Chalk Lime and Allied Industries Research Association on October 4 and 5 from 2 p.m. to 5.30 p.m., at its laboratories in Church-street, Welwyn, Hertfordshire. Exhibits will cover the association's work, and in particular that on lime and sandlime brick production, building mortars and the use of lime in road construction.

Distributing Building Data

ESTABLISHMENT of area offices in Belfast, Dublin, Birmingham, Bristol, Leeds, Edinburgh and Glasgow has been put into operation by Specifile Ltd., who already have information centres in the West End of London and in Croydon. In Bristol, the Building Centre is collaborating. The company intends shortly to step up its activities to cater for the builder in the matter of planned data.

Industrial Film Awards

AMONG THE FIRMS who received awards in the first Industrial Film Competition, organised by Industrial Screen, were the British Oxygen Co. Ltd., for a film showing the uses of a life-saving device called 'The Minuteman'; the Rentokil Group Ltd., for an account of the cockroach and the problems of its elimination; the Esso Petroleum Co. Ltd., for a film about life on the Pembrokeshire coast; J. Lyons and Co. Ltd., for a film about the opportunities for day release education for young employees; and the Alkali Division of Imperial Chemical Industries Ltd., for an account of training in teamwork. The films, which were shown in London on September 4, were made by the firms themselves, using their own staff and resources.

A Roof Over Fleet-street

A ROOF over Fleet-street, bridging the gap between the buildings on either side is one of the possibilities envisaged in an article in the September/October issue of 'Interior Design and Contract Furnishing.' The fume-laden atmosphere, it is suggested, could be drawn off by ventilation equipment and, though it might be raining outside, pressmen treading the pavements would still remain 'high and dry.' Carrying the idea still further, the writer visualises a fully-enclosed housing estate for 2,000 people and covered-in centres comprising ten or twelve six-storey office blocks, cafés, shops and banks. 'Interior Design and Contract Furnishing' is published by the National Trade Press and is edited by Maurice Jay.

Personal Column

Messrs. Turner & Newall, Ltd. announce that MR. J. E. HUTTON, who until recently was sales director of the Asbestos Cement Ltd., one of their subsidiary companies in India, is to join the board of Turners Asbestos Cement Co. Ltd. on October 16.

Although the board of Messrs. Turner & Newall Ltd.'s new manufacturing subsidiary in Nigeria, Turners Asbestos Cement (Nigeria) Ltd., has not yet been fully constituted, the parent company's representatives on that board will include MR. R. M. BATEMAN (the present deputy chairman of the parent company), MR. K. NEVE (member of the board of the parent company) and SIR JOHN RANKINE, KCMG, KCVO, who until his recent retirement, was the Governor of the Western Region of Nigeria.

The Stonhard Co. Ltd. announce the appointment of four new flooring and building maintenance representatives: They are: MR. W. J. STILLMAN (Nottinghamshire, Leicestershire and Lincolnshire), MR. J. G. LEEMING (Yorkshire), MR. J. P. C. PAYN (the Home Counties) and MR. K. H. LUSCOMBE-WHYTE (London).

The Nuralite Company Ltd., a member of the British Uralite Group, Whitehall-place, Gravesend, Kent, announce the appointment of the following regional sales representatives: northern region—MESSRS. HAROLD ASPIN, EDWARD TURNER, HOWARD SUDDES, and KEITH LIGGINS; eastern region—MESSRS. GEORGE BOULTBEE and MICHAEL BOWERS; and western region—MR. EDRYD GEORGE.

MR. C. E. G. NYE, MC, has retired from the Board of George Cohen Sons & Co. Ltd.

Company News

ACROW (ENGINEERS) LTD. recommend the payment of a final dividend of 12½ per cent (less tax), making 50 per cent for the year ended March 31, 1961 (1960 = 47½).

THE BLUE CIRCLE GROUP OF COMPANIES are to increase their output by 1,500,000 tons a year by the end of 1963. This is made known in a 'Review of 1960' distributed by the Group recently to all employees and shareholders. Last year the Group's total cement deliveries were 10,917,533 tons, which included 2,489,533 tons from works overseas in which it is interested.

RUBEROID CO. LTD. has recommended the payment of an interim dividend of 6 per cent (less tax), payable on Sep. 30 (same).

The board of the UNIVERSAL ASBESTOS MANUFACTURING CO. LTD., in announcing an unchanged rate of interim dividend of 5 per cent on the capital, increased by a one for four scrip issue in March last, state that it is not intended to imply the maintenance of the same total rate of dividend as in the previous year. It is solely to reduce the disparity between the interim and final dividend payments.

Lakeland Green Slate

Used . . . For wall-cladding, window-surrounds, and cills, steps, coping, flooring, fireplaces . . . In more and more of Britain's most outstanding contemporary buildings —at Coventry Cathedral for instance . . .

Because its natural beauty and colouring remain unaffected or spoiled by weather or industrial dirt and it is able to offer structural strength with immense scope for design . . .

Details and literature from

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OVERSEAS BUILDING

From Our Own Correspondents

AUSTRALIA.—A dam, the largest in Australia, is planned at Chowilla, South Australia, subject to the consent of Victoria and NSW. It will cost £A13m. and cover an area of 400 square miles in the three states.

AUSTRALIA (QUEENSLAND).—It is reported that the Brisbane City Council has approved plans of the Commonwealth Government War Service Home Division for a 313 homes' estate at Chermside.

COLOMBIA.—The manager of the Instituto de Crédito Territorial has stated that in the next two years some 600m. pesos will be invested in various housing schemes and that further programmes have been planned in order to eliminate the present housing shortage within a decade.

KENYA.—Nairobi airport is to be improved considerably in the near future. A contract has been placed by the Kenya Ministry of Works with John Howard and Co. (Africa) Ltd. for a £210,000 extension.

KENYA.—Work has now started on improvements to Nairobi Airport which will cost £¼m. Of this sum, £210,000 has been allotted for extending the runway and the recent installation of modern navigational equipment. The additional £40,000 will be spent on improved lighting. It is anticipated that both of these projects will be completed by the middle of 1962.

REPUBLIC OF SOUTH AFRICA.—The new men's residence to be built by the University of the Witwatersrand in Johannesburg will cost about £150,000. Work on two of the sites there will start in the middle of next year. . . . Architects are starting work on plans of the new £200,000 Vereeniging-Vanderbijlpark district police headquarters, which will be completed by the end of 1963.

REPUBLIC OF SOUTH AFRICA.—The National Housing Commission has formally approved the construction of the £13m. housing scheme for 20,000 Indians at Chatsworth, near Durban. Permission has been received for the construction of the first 1,872 houses at a cost of £650,000. Development work is to begin at once. . . . Two buildings, together costing £270,000, are to be erected soon for the University of the Witwatersrand Medical School. They are a medical library and administration offices costing £200,000, and a students' refectory. Plans for the three-storey administrative building are being drawn up for approval by the University Council and will be designed so that another seven storeys can be added to house the clinical departments of the medical school.

RHODESIA AND NYASALAND.—£5¼m. is to be allocated this year, subject to parliamentary approval, by the Federal Government for building works and ancillary services. £3m. is to be reserved for Southern Rhodesia.

RHODESIA.—An American millionaire,

Mr. N. R. Mabey, who represents large US financial interests, has been concluding what is understood to be final negotiations for the building of a £1m. luxury hotel on the banks of the Victoria Falls.

SOUTHERN RHODESIA.—Barclays Bank DCO reports that the value of building plans passed in June rose sharply to £1,588,000 (the highest monthly total since July, 1959) and included plans worth £1,161,000 passed in the Salisbury area and worth £379,000 in the Bulawayo area. . . . The first part of the £1.3m. Tshabalala African Township near Bulawayo was recently opened. The Bank states that this is a home-ownership scheme which, it is hoped, will eventually include 2,500 houses consisting of sitting room, dining room, bedroom, kitchen and bathroom. . . . The British Government is to provide a grant of up to £400,000 in due course towards the completion of the proposed teaching hospital in Salisbury.

SPAIN.—Cementos Omedes has been authorised to establish a factory at San Julián de Ramis, Gerona, for the production of 7,000 tons of aluminous cement a year. Building will start within 6 months and take two years.

Work Scarce in Rhodesia

THE PRESIDENT of the Bulawayo Master Builders and Allied Trades Association in the Federation of Rhodesia and Nyasaland told the Federation of Master Builders Congress at Umtali on August 25 that 'tragic deterioration' in the building industry had led to price slashing on an unprecedented scale and that the few contracts that had been available had been eagerly tendered for. He stated further that there might be a possible shortage of skilled workers if present conditions improved, and said 'African artisans are available but really skilled men are extremely difficult to find. . . . Very few applications for apprenticeship are being submitted at present.'

Metal Windows and Doors

IT IS ANNOUNCED by Reliance Metal Window (Rhodesia) (Pvt.) Ltd., of Salisbury, Southern Rhodesia, an associate company of Williams & Williams Ltd., of Chester, that their contract has been renewed by the Nyasaland Government Tender Supplies Board from September 1, 1961, to August 31, 1962, for steel windows and doors and pressed steel door frames which will cover requirements for the PWD Stores branch. Last year's contract was for £20,000.

Big Drop in S. African Building

THE RECESSION in South Africa's building industry is shown in figures issued in Pretoria for building plans passed in the first six months of this year. Compared with the same period last year, the drop is slightly less than £11½m. This covers all types of building. Plans for flats show the largest drop—from £30½m. last year to £22m. The number of new house plans fell by 800, and their value by £2½m. The total of all plans passed in the first six months of this year was £39m., compared with £50½m. during the same period in 1960.

Overseas Contract Open

ARGENTINA.—The Direccion Nacional de Vialidad has called for offers for five road construction projects in various provinces. Closing dates vary between October 16 and December 26, estimated costs between 135 and 514m. pesos. Information available from Economic Counsellor, 111 Cadogan-gdns., London, SW3. . . . Notice is also given of Public Tender No. 3998, for import of road graders for approximately 447m. pesos. Closing date October 6. Information from Sala de Licitaciones, Direccion Nacional de Vialidad, Avenida Maipu 3, Planta Baja, Buenos Aires.

SCOTTISH BUILDER

Scarcity of Building Land

IN HIS annual report, the Burgh Engineer of Kirkcaldy, MR. R. MELDRUM, has expressed fears about the rising cost of building land. The position is aggravated, he states, because of the amount of space being swallowed up by private contractors who are erecting only half as many houses to the acre as the Town Council.

Reporting that 70 private houses were built during the year and 73 more were under construction, Mr. Meldrum said 'Densities of only eight houses to the acre are only half of what the Council are providing and good building land is becoming very scarce and expensive.'

Statistics show that 471 houses were built in the burgh compared with 242 the previous year, but Mr. Meldrum warns that difficulties in obtaining technical staff are still acute and that during the coming year there will be several weeks when no houses will come off the production line.

Seventeen Factories for Loanhead

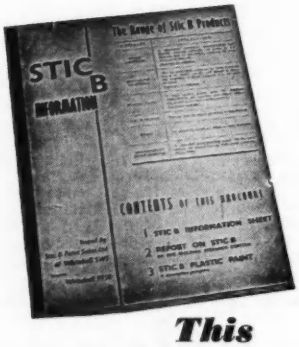
NEW FACTORIES, numbering 17 and covering 72,000 sq. ft., are to be built shortly on a site at Edgefield-rd., Loanhead. The factories are aimed at attracting small and medium industrial developments to the area. The factories would be built in three separate single-storey blocks, and would range in size from 3,000 to 5,000 sq. ft., though, if necessary, some of the units could be amalgamated to provide buildings of 15,000 sq. ft. and more.

The central block, explained MR. G. RITCHIE, deputy county clerk, Midlothian CC, would comprise nine factories each of 5,000 sq. ft. 'This is a pioneer scheme of "nest" factories designed to give modern accommodation to small firms that are either starting up or moving from inferior works,' said Mr. Ritchie. Work on preparing the site will start very soon and it was hoped to have the factories completed by next summer.

Twenty Factories for Glasgow

A SCHEME has been announced which will probably result in 20 new factories rising on a 35-acre site known as 'Dixon's Blazes' steelworks, in Hutchesontown, Glasgow.

Taylor Woodrow Industrial Estates who have purchased the land, have begun preparing the site where they hope to build factories varying from 5,000 to 25,000 sq. ft. Several firms have already expressed interest and it has been estimated that the value of the building development alone will be some £3 million, and that the total investment, including plant and machinery, will be between £6 million and £8 million. The project will be officially known as the 'Dixon's Blazes' industrial estate. (Further details on page 541.)



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New Buildings

EDINBURGH.—The Ministry of Works is to build a new telephone exchange at East London-st., Edinburgh. The St. James-sq. comprehensive development plan has not been approved in principle and awaits Government viewpoint. The telephone exchange was originally included in that project.

KIRKCALDY.—A community centre has been planned for the Templehall area of Kirkcaldy which was commenced over 10 years ago and now has a population of 10,000. The etimated cost is £48,200, a third of which is to be contributed by the Coal Industry Social Welfare Organisation.

QUEENSFERRY.—Hopetoun Estate Development Co. is to build a hotel, motel and houses on the new Forth-rd. Bridge-rd. at South Queensferry and approval has been given. The Council has also approved the erection of 140 privately-built houses in the area.

ST. ANDREWS. — Improvements are recommended for the Step Rock bathing pool. Estimated cost is £20,678. The proposals involve cutting the present pool down to 50 metres in length and raising the walls to keep the tide from washing over into the pool.

THE BUILDER CONSTRUCTION NEWS

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list, see previous issues. Those preceded by the symbol (A) are advertised in this number. The latest date for the receipt of tenders or applications appears above each paragraph. The symbol (R) preceding each entry indicates that applications must be received by this date.

BUILDING

SEPTEMBER 25

(AR) EAST SUFFOLK STANDING JOINT COMMITTEE.—Erection of a pair of police houses at Lowestoft. County A. Tenders by Oct. 20.

SEPTEMBER 28

(AR) SURREY CC.—Firm price tenders for alterations and extensions to Welbeck CS sch., St. Helier, Carshalton, and Winchcombe CS sch., St. Helier, Carshalton (two contracts). County A.

(AR) UXBRIDGE BC.—Erection of central depot at Harlington-rd., Hillingdon. Boro' E&S.

SEPTEMBER 29

(AR) BASILDON UDC.—Erection of 56 three-bed maisonettes at Victoria-rd., Laindon, Essex, and 46 garages at Winifred-rd., Pitsea. E&S. Dep. £2 2s.

(AR) HALESOWEN BC.—Erection of 253 dwellings at Highfields. TC.

(AR) LUTON BC.—Fixed price tenders for seven houses, shop and outbuildings, etc., at Lewsey housing estate. Boro' A.

(AR) ROTHERHAM CBC.—Erection of 89 flats and 104 garages at Laudsdale-rd., East Herringthorpe estate. Boro' E. Dep. £5 5s.

(AR) WEST RIDING STANDING JOINT COMMITTEE.—Firm price tenders for the erection of police houses. Clerk to C.

SEPTEMBER 30

(AR) ESSEX CC.—Firm price tenders for: (a) Alterations and additions to Ilford fire brigade training sch.; (b) extensions to Wanstead training centre; (c) extensions to Chelmsford training centre. County A (separate applications).

(AR) ESSEX CC AND COURT OF QUARTER SESSIONS.—Firm price tenders for the erection of police houses on various sites (eight contracts). County A (separate contracts).

OCTOBER 2

(A) MERTHYR TYDFIL CBC.—Fixed price tenders for an old persons' hostel at Gurnos estate. Boro' A. Dep. £2 2s.

(AR) PORTSMOUTH City C.—Erection of: (a) 54 flats at Halstead-rd.; (b) six shops and maisonettes, two flats and housing office at Paulsgrove; (c) alterations to Copnor mod. sch. for girls and prim. sch. City A. Dep. £1 (each contract).

OCTOBER 3

(AR) EAST SUFFOLK CC.—Firm price tenders for the erection of additions at Ringshall prim. sch. County A. Tenders by Nov. 9.

OCTOBER 6

(AR) PORTSMOUTH CITY C.—Modernisation of flats at St. Faiths-rd. Director of Housing. Dep. £1.

OCTOBER 9

(A) NORFOLK CC.—Erection of Litcham county prim. and Martham sec. mod. schools. Ch. Ed. Officer.

OCTOBER 10

(A) HESTON & ISLEWORTH BC.—Erection of messroom, stores and workshop at Lampton Park Nursery, Hounslow. Boro' E&S. Dep. £2 2s.

OCTOBER 12

(A) CARDIFF CORPN.—Fixed price tenders for: (a) 20 flats at Braubton-ave.; (b) 35 dwellings at Parracombe-cres. City A. Dep. £2 2s. (each contract).

(A) NORTHFLEET UDC.—Erection of 12 houses at Painters Ash estate. E&S. Dep. £2 2s.

OCTOBER 13

(A) STAINES UDC.—Fixed price tenders for two pairs of houses, one three-storey block of 15 flats and maisonettes and 13 garages at Town-la., Stanwell, Middx. Clerk to C. Dep. £2 2s.

OCTOBER 16

(A) HEMEL HEMPSTEAD BC.—Erection of a public convenience adjacent to the shopping centre at Stoneycroft, Warners End. Boro' E.

(A) HESTON & ISLEWORTH BC.—Erection of a public convenience at Hounslow. Boro' E&S.

(A) WOKINGHAM BC.—Fixed price tenders for five dwellings at Toutlet Common. Boro' S.

OCTOBER 20

(A) STAINES UDC.—Fixed price tenders for four pairs of houses, two three-storey blocks of 15 flats and maisonettes and 72 garages at Town-la., Stanwell. Clerk to C. Dep. £2 2s.

OCTOBER 24

(A) BASINGSTOKE BC.—Erection of 196 dwellings and 147 garages at South Ham estate. Boro' A. Dep. £2 2s.

OCTOBER 30

(A) CROYDON CBC.—Erection of 35 pram stores, small maintenance store, 24 garages and parking area for 32 cars at Auckland Rise housing estate. Boro' E.

SERVICES, PAINTING, MATERIALS, ETC.

SEPTEMBER 29

(A) EALING BC.—Redecoration of Northolt Grange library, Yeading-la., and redecoration and minor repairs at Hanwell library, Cherington-rd., Hanwell, W7. Boro' E.

OCTOBER 7

(A) DAGENHAM BC. — Concrete roof tiling to 52 houses at Oxlow-la. estate. Boro' E&S.

OCTOBER 16

(A) THURROCK UDC.—Rebuilding of 32 chimney stacks in Tilbury area. Estates Manager.

(A) WEST HERTS. GROUP MANAGEMENT COMMITTEE.—Fixed price tenders for the demolition of a chapel at Shrodells Hospital, Watford. Group Sec., 9 Rickmansworth-rd., Watford, Herts.

OCTOBER 30

(A) ROMFORD BC.—Erection of playhut and toilets at Chelmsford-ave. playground. Boro' E&S. Dep. £2 2s.

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MUNICIPAL AND CIVIL ENGINEERING WORKS, ETC.

OCTOBER 2

HAVERFORDWEST RDC.—Provision and laying of approx. 2 miles of 3 in. asbestos-cement pressure pipe and spun-iron pipe of various classes together with the construction and completion of a 20,000-gallon mass and reinforced concrete service reservoir, with valves, fittings and ancillary works. The site of the works is approximately 9 miles north north west of Haverfordwest. S & Water E.

OCTOBER 16

ABINGDON RDC.—Construction of five miles of small dia. sewers and rising mains and four pumping stations, at Appleford and Milton. Howard Humphreys & Sons, engrs., West-st., Epsom, Surrey. Dep. £5 5s.

OCTOBER 21

(A) KEIGHLEY BC.—Extension to Abattoir. A. Sutherland, architect and surveyor, Barclays Bank-chbrs., North-st., Keighley. Dep. £2.

GENERAL BUILDING WORK (LONDON)

WESTMINSTER. — Site Bought. — The Charles Forte Organisation has bought the Winter Garden, in Drury-la., from Pearson, Forsythe & Co., who bought it from the Rank Organisation in 1959. The future of the theatre is uncertain, but new proposals for the site are expected. Architects had drawn up a redevelopment plan for an area between Macklin-st. and Shelton-st., including a 900-seat theatre, but they are now awaiting fresh instructions. The LCC, as planning authority, has insisted that a replacement theatre should be included.

(PROVINCIAL)

ABRAM.—Mr. J. W. Liptrot proposes residential development on 9 acres of land at Lee-la.

ACCRINGTON.—Harrison & Arnfield propose erection of 12 bungalows at Waddington-rd. . . . BC have approved plans for erection of new swimming bath.

ALDERSHOT.—War Department propose rebuilding of barracks at Stanhope Lines, £1,000,000 est.

BAKEWELL.—UDC propose improvements to cattle market.

BARNSLEY.—BC propose erection of old people's bungalows at Monk Bretton.

BOLDON (Co. Durham).—UDC are planning the erection of 65 bungalows north of Charles-st., Boldon Colliery. Surveyor is J. T. Edmondson.

BOLLINGTON.—UDC propose residential development at Clarke-la.

BOLTON.—Lancs. CC is reserving 30 acres of land, east of New Brook-rd., and 5½ acres of land, North of Stitch-mi-la., for residential purposes. . . . BC propose erection of 48 flats and 30 sd bungalows at Green Way. . . . John Turner & Sons Ltd. propose erection of 38 houses, 20 garages, roads and sewers at Crescent-rd.

BOOTLE.—BC propose erection of subdivisional police station at Park-la., Dunnings Bridge-rd., Netherton. Est. £39,000.

BRISTOL.—Fairlanes Bowling Ltd. are seeking 2 sites for the erection of bowling rinks. . . . Principality Holdings Ltd. propose new shop, warehouse and office block at St. Thomas-st. Architects: Alex F. French & Partners, Bristol.

BURNLEY.—Mecca Ltd., London, propose erection of dance hall with manager's flat at Yorkshire-st. . . . The directors propose restoration work to Church Institute, Manchester-rd., after fire damage.

CALNE & CHIPPENHAM.—RDC has approved the erection of a block of aged persons' dwellings at Derry Hill.

CASTLE WARD (Northumberland).—Detailed plans have been approved for a development scheme at Ponteland for Green-

sitt Brothers, builders and contractors, 18 Nixon-st., Newcastle-on-Tyne. The plan includes shops, offices and flats. Architects are R. Turley and Associates, 46 Jesmond-rd., Newcastle-on-Tyne. . . . John T. Bell & Sons, builders, Market-st. Chbrs., Newcastle-on-Tyne, have received planning permission for housing developments on the Whorlton Grange estate, Westerhope.

CHAPEL-EN-LE-FRITH.—Derbys. CC has revised the Town Map in Manchester-rd. area to provide an ambulance station, swimming pool and clinic.

CHEADLE (Staffs.)—CC propose erection of welfare clinic at Ashbourne-rd. during 1961/62.

CHERTSEY.—Woking and Chertsey Group Hospital Management Committee approved plans for a new chapel at St. Peter's Hospital, Chertsey.

CHESTER.—The Small Holdings Dept. of Ches. CC propose improvements to farm buildings and dwelling houses. . . . Thomas & Evans Ltd., Brentford, propose erection of new depot at Sealand trading estate.

CHESTERFIELD.—Birtley Engineering Ltd. propose erection of new offices at Barker-la. . . . F. Clifton Ltd. propose erection of 176 dwellings, road and sewer works, at Mansfield-rd., Winsick.

CHESTER-LE-STREET.—Plans have been prepared by Fennell and Baddiley, Bridge End-chbrs., Chester-le-Street, for the erection of 11 houses at Front-st., Pelton Fell, for Mrs. Oliver, and 10 houses at Castle View, for H. E. Brown.

CHESTERFIELD.—F. W. Woolworth & Co. Ltd., London, propose erection of shop premises at Burlington-st., Church Way.

CHRISTLETON.—Ches. CC propose erection of new county school.

COLNE.—BC propose redevelopment at Market-st. to include three blocks, shops, bus station and car park, after demolition of existing buildings. Est. £250,000.

COOKHAM.—Plans submitted to RDC: Flats and garage adjoining Monkey Island-la., Bray, for Mr. C. Reynolds; 3 buildings at Hawthorn Hill Racecourse for Mr. L. Lipton.

CREWE.—Following for BC: Loan for erection of new public library, £120,000 est; re-building Corn Exchange after damage by fire.

FENISCOWLES.—RC Auths. propose erection of new Church & Presbytery to replace Pleasington Priory.

FROME.—Milk-st. county sch. is to be modernised for Somerset Education Committee. Est. £64,000.

HAM (Surrey).—Housing development on 30 acres of Riverside land is proposed by Wates Ltd.

HARTLEPOOL.—Matkin and Hawkins, Barclays Bank Chbrs., Fawcett-st., Sunderland, are the architects for a factory of 20,000 sq. ft. on the Hartlepool's trading estate for Messrs. Ambros Shardlaw & Co., Sheffield.

HAYDOCK.—William Twist & Sons Ltd. propose erection of depot at Haydock industrial estate.

HINDLEY.—Church Auths. propose erection of school premises adjoining All Saints Church.

HORLEY.—A sketch lay-out has been submitted to the local council for the erection of 22 three-storey maisonettes at Cranbourne, Balcombe-rd.

HUDDERSFIELD.—A Mormon chapel is to be built at Birchencliffe by the Church of Jesus Christ of Latter Day Saints. Est. £45,000.

LANCASTER.—County approval is being sought by TC to inclusion of parish of Scotforth in City boundary in connection with scheme for new Lancaster University.

LANCS.—CC propose erection of public library on section of Culcheth children's playground, Golborne.

LEEDS.—Joshua Tetley & Son Ltd. propose extensions to brewery at Hunslet-rd. . . . RC Auths. propose erection of sec. sch. adjoining Toad's Hole Wood. . . . Forest Products of Leeds Ltd. propose converting Clifton Cinema, Bramley, into offices and warehouse.

LEEK.—Staffs. CC propose erection of training centre and junior hostel.

LEEK.—RDC have approved a scheme for the erection of old people's dwellings.

Contracts Placed

We are glad to receive from architects and quantity surveyors for publication details of contracts placed to the value of £20,000 or over. Such information should reach the Editor as soon as possible after the contract is signed. Names of the architect and other consultants associated should be given.

LEIGH.—BC propose erection of new market, adjoining Parish Church, rear of Leigh-rd.

LEYBURN (Yorks).—RDC is to place contract for the erection of 22 Unity traditional dwellings at Middleham (16) and Newton-le-Willows (6). Plans by the Surveyor, Thornborough Hall, Leyburn.

LIVERPOOL.—TC propose extensions to central library. . . . Rodney Youth Centres Ltd. are to convert shops and offices in Mulberry-st., into youth centre. . . . A new factory is to be erected at St. James-st. by Bradleys (Chester) Ltd.

LIVERPOOL. — The Shop Construction Group of Companies, London, propose erection of offices, shops and car park, at Bold-st.

LLANDUDNO.—A future town centre redevelopment scheme being discussed by BC and Mostyn Estates Ltd.

LONGRIDGE.—UDC propose erection of public hall at Towneley-gdns.

MAIDENHEAD.—PC Council propose rebuilding of St. Mary's Borough Church, £40,000 est. Architect: Lord Mottistone.

MANCHESTER.—Manchester's new College of Commerce will cost about £650,000 to build and equip. It will rise to a height of 12 storeys on a site on the corner of Sackville-st.—the original proposal was for a central block of 15 storeys, but the height has now been lowered by revising the plan to allow for greater width.

MANCHESTER.—Nathan Brown Estates Ltd. propose erection of an 11-storey block of flats and garages, adjoining Casino Cinema, Platt-la. . . . The Manchester Guardian Society for the Protection of Trade propose additional storey to existing building at Mosley-st. . . . Manchester & Dist. Federation of Boys' Clubs propose re-housing 4 existing clubs and erection of 6 new clubs, £200,000 est.

MANCHESTER.—Following for TC: Old people's club at Bell-st., Openshaw; College of Further Education at Quay-st./Hardman-st.; slab block and tower block flat development at Platt Court site, Wilmslow-rd., Rusholme; 10 two-storey aged persons' dwellings, 8 aged persons' bungalows, 29 houses and 48 four-storey maisonettes (95 dwellings in all) at Ferndown-rd./Altrincham-rd., Brooklands; new site for Smithfield Market; negotiating of tender with F. Gannon & Son (Manchester) Ltd. for 44 dwellings at Nuthurst-rd., Moston. . . . Ferndale Marshall Ltd. propose erection of a two-storey factory at Dark-la., Jowett-st., Ardwick. . . . Aborn Estates propose erection of offices and warehouse at Broughton-st. . . . M. Basgar & Co. Ltd. propose a two-storey extension to factory at Trafalgar-st. east, Cheetham. . . . Fielden Bros. Ltd., and Scottish Insurance Corpn. Ltd., propose erection of office block and shop at Pall Mall, Norfolk-st. . . . David Rosenfield Ltd., and Henleys Ltd., propose workshop and offices at Cheetham Hill-rd., Cheetham. . . . Commercial & Business Properties (Manchester) Ltd. propose erection of a 6-storey office block and car park at 5/7 Cheapside. . . . Wettern Bros. (Manchester) Ltd. propose erection of two-storey office and storage accommodation at Albany-rd., Chorlton-cum-Hardy. . . . Heaton Mills Printing Co. Ltd. propose erection of single-storey offices and warehouse at Heaton Park-rd., Higher Blackley. . . . Maypole Dairy Co. Ltd., London, propose erection of shop premises at Wilbraham-rd., Chorlton-cum-Hardy. . . . L. Lapidus & Co. Ltd. propose a 3-storey factory extension at Cheetham Hill-rd., Cheetham. . . . Town & Commercial Properties Ltd. propose erection of a 4-storey block of shops at Oldham-st. after demolition of existing property.

MARPLE.—Geo. Wimpey & Co. Ltd. propose residential development, together with roads and sewers, off Andrew-la.

NANTWICH.—Mr. P. Moseley proposes residential development at Nantwich-rd., Audlem. . . . W. Yoxall & Son propose erection of 11 pairs of dwellings at Dig-la., Wybunbury.

NEWBIGGIN (Northumberland). — UDC has approved plans by the County Architect, 30 Great North-rd., Newcastle-on-Tyne, for the erection of a sec. sch. near Welfare-cres.

NEWCASTLE-ON-TYNE.—City Council has received loan sanction for £168,451 for stage 5 of the new Rutherford College of Technology; £11,763 for roads and sewer works on the Longbenton Estate (No. 4 Unit); and £12,500 for extending apron at Woolsington Airport. City Engineer is D. T. Bradshaw. . . . The Council of King's College is to erect a physical education centre on the site of Haymarket-hse., Haymarket, Newcastle, but it is not expected that the work will be ready to proceed for some years.

NEWCASTLE-UNDER-LYME. — BC propose erection of shopping arcade and market, after demolition of existing property.

NORTHWICH.—RDC negotiating for purchase of site at Bowmere-rd., Tarporley, for residential purposes.

OXSHOTT.—Oxshott Brickworks Ltd. propose erection of houses adjacent to brickworks at Littleheath-la.

PENMAENMAWR.—UDC propose erection of bungalows at Bryn Bella site.

PORTSMOUTH.—CC has approved in principle the provision of a wholesale fruit and vegetable market on land north of Charlotte-st., with a high-level car park for 350 cars over it. Est. cost £282,000.

POTTERNE (Wilts).—Devizes RDC has granted outline permission to Mr. S. R. Dodge for erection of not more than 50 dwellings and an estate road on 11 acres at Blounts Court, Potterne.

POULTON-LE-FYLDE.—RC Auth. propose erection of new Church of St. Monica's, Preston New-rd.

READING.—Reading and Dist. Hospital Management Committee propose improvements and alterations to out-patients and casualty departments at Battle Hospital, £40,000 est.

RHYL.—UDC propose erection of 17 flats at West-st./Stanmore-st./Warren-rd.

ROCHDALE.—Salford RC Diocesan Trustees propose erection of new St. Wilfrid's sec. mod. sch.

ST. HELENS.—RC Auth. propose erection of new church at Howards-la., Eccleston.

SALFORD.—H. Pace proposes erection offices and warehouse at West Charles-st. . . . Following for TC: Ambulance headquarters at Charles-st., Pendleton, £91,000 est.; multi-storey flats and maisonettes at Bury New-rd.; scheme for multi-storey flats at Ellor-st. (consideration only).

SHEFFIELD.—Sheffield Diocesan Trust & Board of Finance, Barnsley, propose erection of new church/vicarage at Gleadless Valley estate. . . . Wm. Stones Ltd. propose erection of public house at Acres Hill-rd.

SHEFFIELD.—A new £250,000 development plan for their Sheffield factory has been announced by Stanley Works (G.B.) Ltd., tool manufacturers. The major part of the plan is the erection of a modern £180,000, 33,000 sq. ft. administration block on a site adjoining the factory. This will release valuable production space at present being occupied by offices in the factory buildings. In addition, a new floor is being added to one wing of the factory and a new line of finishing shops, now nearing completion, have been added, providing a total of 20,000 sq. ft. Work on the new administration building is expected to begin towards the end of this year and to be completed about the end of 1962. It will occupy the site of the present works canteen which is housed in a former church mission hall built in 1883. This will be demolished and the canteen moved to a more convenient position in the factory.

SHIPLEY.—The Metal Box Co. Ltd. propose extensions to factory at Dockfield industrial estate.

SLOUGH.—London and Provincial Shop Centres Ltd. propose redevelopment of 288/294 High-st. Architect: H. Owen Luder, 29 Regency-st., London, SW1. . . . P. B. Cow & Co. Ltd. propose extensions to premises at Dover-rd. Plans by Slough Estates Ltd.

SOUTHAMPTON.—BC plan erection of Hightown prim. sch. Est. £51,920. . . . BC is recommended to negotiate with W. E. Chivers & Sons Ltd., 59 Park-st., Devizes, for the reduction of their tender of £366,712 for the building of Hightown sec. mod. sch., to conform to MoE's authorised limit of £302,500. . . . BC recommended to offer the erection of Bellemoor sec. sch. to Gilbert-Ash Ltd., Turnpike House, Notting Hill Gate, W11.

STAFFORD.—Staffs. CC propose conversion of Shugborough Hall into County Museum with social facilities for staff.

STOCKPORT.—Cornbrook Chemical Co. Ltd. propose erection of new factory at Newbridge-la.

SUNDERLAND.—S. W. Milburn & Ptnrs., 9 Esplanade, Sunderland, are the architects for the proposed erection of a factory of 115,000 sq. ft. at Pallion for Perdio Ltd., of London. The premises will be built under the authority of the Industrial Estates Management Corporation, Team Valley Trading Estate, Gateshead. Work will start early next year. . . . Plans are being prepared by C. Solomon, 30 St. Mary's-pl., Newcastle-on-Tyne, for the erection of shop premises on the Hylton Castle estate for Carricks Caterers Ltd., Cowgate, Newcastle-on-Tyne. . . .G. T. Brown & Son, 14 Grange-terr., Stockton-rd., Sunderland, are the architects for a 5-storey office block at Thornhill Park for the Durham Divisional Coal Bd.

TREFRIW.—RC Auth. propose erection of new church to replace Our Lady and St. Winifred's.

UTTOXETER.—UDC are to invite fresh tenders for construction of open-air heated swimming pool.

WASHINGTON (Co. Durham).—It has been confirmed that Tube Investments Ltd., Birmingham, are to contruct a factory on a 280 acres site in the Washington area. Preliminary work is expected to start early in 1962, and when in full operation, the new works will employ 3,000 men and women.

WATFORD. — North-west Metropolitan Regional Hospital Bd. propose improvements to pathological laboratory at the Peace Memorial Hospital.

WIGAN.—Following for BC: Multi-storey flat development at Scholes redevelopment area; seeking Ministry approval for development of land at Roundhouse Whelley for private housing purposes. . . . CE Auth. seek site at Bottling Wood area for erection of new CoE sch.

WILMSLOW.—UDC propose erection of shops at Wilmslow By-pass (A34).

WILTON (Wilts.).—Work is to start on a major school extension at Wilton sec. mod. sch., comprising new administration block, 6 new classrooms, new artcraft room, new housecraft department, rural science laboratory, school hall and gymnasium.

TENDERS

(A) Denotes *accepted.*
(PA) Denotes *provisionally accepted.*
(RA) Denotes *recommended for acceptance.*
(AM) Denotes *accepted subject to modification.*
(GD) Denotes *accepted subject to approval by appropriate Government Department.*

ABINGDON.—Erection of 31 dwellings, roads and sewers at Appleton housing estate for RDC. (A) F. J. Minns & Co. Ltd., Botley, Oxford.

BAKEWELL.—Erection of 10 houses and 6 bungalows at Bradwell for RDC. (A) Furniss & Hassell.

BASINGSTOKE.—New factory at Lister-rd. for Van Mopps Ltd. (A) Percy Bilton Ltd., London.

BIRMINGHAM.—New dental hospital at St. Mary's Row for United Birmingham Hospitals. (A) C. Bryant & Son Ltd., £1,200,000. Erection of 20-storey block at Halls of Residence, Birmingham University. (A) C. Bryant & Sons Ltd., £1m. New Inner Ring road at Horsefair and Holloway Head junction for CBC. (A) C. Bryant & Son Ltd., £750,000. New office block at Kingsbury-rd for Yarwood Ingram & Co. Ltd. (A) C. Bryant & Son Ltd., £150,000. Office and warehouse block at Loveday-st. for J. Gillman & Son Ltd. (A) C. Bryant & Son Ltd., Birmingham, £100,000.

BISHOP'S CASTLE (Salop).—Erection of 18 bungalows, warden's accommodation and communal facilities at Drews Meadow for BC. (A) Selleck, Nicholls, Williams Ltd., Cornwall, £40,810.

BOLTON.—Erection of 55 dwellings and 16 garages at Higher Bridge-st. for BC. (A) William Townson & Sons Ltd. Erection of 74 dwellings and 12 garages at Prince-st. for BC. (A) William Townson & Sons Ltd.

BRISTOL.—New store for Littlewoods at The Horsefair. Architect: Littlewoods' own architectural dept. (A) Griggs & Son, £308,219.

BULLINGDON.—Erection of 14 houses and 6 bungalows at Little Milton for RDC. (A) H. Emery & Sons Ltd., High Wycombe, £44,259.

CHELTENHAM.—New hostel block at St. Pauls College, 'Rosehill,' for Council of Cheltenham Church of England Training College for Teachers. Architects: Healing & Overbury. (A) Ford & Weston Ltd., £44,497.

DURHAM.—Construction of control tower at Lamesley marshalling yard, near Chester-le-Street, for British Transport Commission. (A) Richard Costain Ltd., 16 Great North-rd., Newcastle-on-Tyne, £90,000.

EASINGTON (Co. Durham).—Erection of 19 houses at High Hesleden for RDC. (A) W. M. Glass Ltd., Ryhope, Sunderland, £21,081.

EASTBOURNE.—(a) Erection of 3, 2-storey blocks of 4 flats on land at Green-st. farm cottages. (b) Erection of 68 houses and flats and 16 garages at Port-rd. for CBC. Boro' S is R. Williams. (A) Building & Public Works Construction Co. Ltd., Swindon, Wilts., £128,731.

HERTFORD.—Fixed price tenders for 20 old people's homes at Watton-at-Stone for BC Architects: D. C. Denton-Smith and Partners. Quantities by Wyatt & Partners. (A) G. Mott & Son, Watton-at-Stone, Hertford.

ILFORD.—Erection of 36 flats with garages at Redbridge-la. for Hilbery Chaplin & Co. Ltd. Architects: Wates Architectural Dept. (A) Wates Ltd., £112,398.

KEIGHLEY.—New sch. at Oakbank Ingrow for West Riding CC. (A) F. Shepherd & Son Ltd., £328,437.

LEEDS.—Alterations and additions to teaching block at Leeds Training College, Becketts Park. Designed by G. Alan Burnett, in collaboration with J. R. Sheridan-Shedden. (A) F. Shepherd & Son Ltd., £700,000.

LIVERPOOL.—Public laundry and swimming baths at Speke for TC. (A) Mears Bros. (Contractors) Ltd., £242,812.

LLANGEFNI (Anglesey).—Creamery extensions for Milk Marketing Board. (A) John Laing & Son Ltd., London.

(GD) LONDON (Air Ministry).—Contracts to the value of £4,000 or over for week ended September 15: *Building work:* Biggin Hill, Kent; Kerridge (Cambridge) Ltd., Catford, London, SE6. *Surfacing work (existing paved areas):* Syerston, Notts.; Constable Hart & Co. Ltd., Richmond, Surrey. *Artificers' work:* Winstone, Glos.; Wm. T. Nicholls Ltd., Gloucester. Cottesmore, Rutland; E. Clarke & Sons (Melton Mowbray) Ltd., Melton Mowbray, Leics. Waterbeach, Cambs., etc. Kerridge (Cambridge) Ltd., Sturton-st., Cambridge. Ternhill, Salop, etc., Seddon (Stoke) Ltd., Stoke-on-Trent, Staffs. St. Mawgan, Cornwall, etc.; G. E. Wallis & Sons Ltd., Truro, Cornwall. Stafford, Staffs., etc.; Lewis & Watters Ltd., Greyfriars, Stafford. Alconbury, Hunts.; Walter Lawrence & Son Ltd., Swaffham, Norfolk. *Painting work:* Cottesmore, Rutland; J. Ibbotson Ltd., Doncaster, Yorks. St. Athan, Glamorgan; William Herd & Co. Ltd., Baker-st., London, W1. Thorney Island, Emsworth, Hants.; William Herd & Co. Ltd., Baker-st., London, W1. *Internal high pressure hot water heating installation:* Binbrook, Lincs.; Richard Crittall & Co. Ltd., Gt. Portland-st., London, W1.

(GD) LONDON (British Railways).—Recent contracts placed by the Eastern Region: Supply and delivery of steelwork for reconstruction of portion of superstructure of underline bridge No. 666 carrying up and down main lines over Metropolitan Water Board's aqueduct, between Lea Bridge and Tottenham; The Butterley Co. Ltd., Butterley, Derbyshire. Construction of a new signal box at Seymour Junction, Staveley; A. Bradbury & Son (Contractors) Ltd., 334 Cemetery-rd., Sheffield 11. Supply, delivery and erection of E.H.V. switchgear for Sheffield (Tinsley) marshalling yard; Crompton Parkinson Ltd., Chelmsford, Essex. Construction of a new signal box at Horns Bridge, Chesterfield; A. Bradbury & Son (Contractors) Ltd., 334 Cemetery-rd., Sheffield 11. Installation of 25 kV. switchgear in track sectioning cabins at Witham and Hill House; Fuller Electric Ltd., Fulbourne-rd., London, E17. Minor modifications at Colchester feeder station, involving the linking up of switchgear with remaining equipment; Fuller Electric Ltd., Fulbourne-rd., London, E17. Demolition of existing bridge over Shepcote-la. and construction of new bridge in its place, also construction of single span bridge over an accommodation road and execution of earthworks at Tinsley, Sheffield; Wellerman Bros. Ltd., Dun-st., Sheffield 3. Construction of control cabin, demolition and recovery of certain redundant assets and alterations to structures at Ipswich motive power depot; R. F. Herron Ltd., Station Parade, Ickenham-rd., Ruislip, Middlesex.

(GD) LONDON (MoW).—Contracts placed for week ended September 2: *Cheshire:* Erection of telephone exchange at Rock Ferry; William Thornton & Sons Ltd., 38 Wellington-rd., Liverpool 8. *Hampshire:* Cooling towers at National Gas Turbine establishment, Pyestock; Film Cooling Towers (1825) Ltd., Chancery-hse., Parkshot, Richmond, Surrey. *Hertfordshire:* Conversion to oil firing at Public Records Office, Ashridge; Fred. G. Alden Ltd., 6-7 New-rd., Oxford. *Lanarkshire:* Erection of a Government office building at Larkhall; Scott & Co.

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B22/9/61

London: External and internal decorations at Government Building, Bromyard-av., Acton, W3; South London Decorators Ltd., Wandle Way, Willow-la., Mitcham, Surrey. *Surrey:* Erection of egg incubator at veterinary research laboratory, Weybridge; E. Clarke & Sons (Addlestone) Ltd., Addlestone, Weybridge. *Worcestershire:* Erection of computer buildings at radar research establishment, Malvern; Espley & Co. Ltd., 62 High-st., Evesham. *Yorkshire:* Erection of 6th floor at Post Office, 36 Park-row, Leeds; J. Pullan & Sons Ltd., Manor-wks., Beeston.

(GD) LONDON (War Dept.).—Contracts placed for week ended September 8: *Berkshire:* Painting at Shrivenham; T. H. Kenyon & Sons Ltd., London, W9. *Devon:* Miscellaneous at Denbury; Willcocks & Stephens Ltd., Paignton. *Dorset:* Steel-framed buildings at Piddlehinton Camp; Maurice Hill Ltd., Horndean. Building at Piddlehinton Camp; Arthur Parsons & Sons, Dorchester. *Kent:* Miscellaneous at Lydd; J. J. Clayson & Son Ltd., Folkestone. *Leicestershire:* Building at Old Dalby; F. Harris & Co., Ltd., Leicester. *Northumberland:* Landing air strip at Redesdale; Thomas Muckle & Sons Ltd., Rothbury. *Nottinghamshire:* Miscellaneous at Chilwell; W. H. Herries Ltd., Nottingham. *Oxfordshire:* Building at Bampton; Wain Bros. (Contractors) Ltd., Swindon. *Co. Tyrone:* Building at Omagh; McCann Bros. (Omagh) Ltd., Omagh. *Worcestershire:* Building at Worcester; J. C. Meades Ltd., Evesham.

MIDDLESBROUGH.—Conversion of the Palladium Cinema, Eastbourne-rd. into shops for Ceres Investments Ltd. Architects: S. John Hill and Partners, Russell-chbrs., 2 Whitfield-st., Gloucester. (A) Brixabur Builders Ltd., 21 Clarence-st., Gloucester.

NEWCASTLE-ON-TYNE. — Erection of St. Augustine's RC sch. Architect: David Brown, 10 Lambton-rd., Jesmond, Newcastle. (A) Ralph Bowey and Son, William-st. south, Gosforth, Northumberland.

NORTH RIDING.—Erection of Whitby West prim. sch. for North Riding EC. Architects: Grenfell Baines and Hargreaves, Preston, Lancashire. (A) John Laing Construction Co., Dalston-rd., Carlisle, £62,000. Erection of infants' sch. at Ormesby for CC. Architect: D. C. Hall, 6 Masons Yard, Duke-st., St. James's, London, SW1. (A) Emco Builders Ltd., 7 Kings-rd., North Ormesby, Middlesbrough, £51,049. Erection of the proposed Malton county jun. sch. for EC Architect: W. W. Atkinson, 4 Raymond-bldgs., Grays Inn, London, WC1. (A) William Birch and Son, Spen-la., York., £53,882.

NOTTINGHAM.—Printing works at Wigman-rd. for Tom Brown & Co. (Nottingham) Ltd. (A) John Laing & Son Ltd., London. Showrooms at Union-rd. for Atkeys of Nottingham Ltd. (A) Arthur G. Glower Ltd.

OXFORDSHIRE.—New prim. sch. at Tower Hill, Witney, for CC. G. Banks, 5 London-rd., Bicester, Oxon. Quantities by Henry Cooper & Sons. (A) Bartlett Bros. (Industrial) Ltd., Witney, Oxon., £52,177.

READING.—Extensions to factory at Basingstoke-rd. for Gillettes Ltd. (A) Aubrey Watson Ltd., Henley.

SHILDON.—Erection of shops at Church-st. for Ceres Investments Ltd., London, EC2. Architects: S. John Hill and Partners, 2 Whitfield-st., Gloucester. (A) Brixabur Builders Ltd., Clarence-st., Gloucester.

SOUTH SHIELDS.—Construction of stores block at Tyne Dock motive power depot for British Transport Commission. (A) Richard Costain Ltd., 16 Great North-rd., Newcastle-on-Tyne.

SMETHWICK.—Erection of two 20-storey blocks of flats, etc., for Corpn. (A) C. Bryant & Son Ltd., £600,000.

STANTON.—Design and construction of a complete slag preparation plant for Stanton Ironworks Co. Ltd. (A) Stothert & Pitt Ltd., £400,000.

STOCKTON-ON-TEES.—Erection of a new grammar sch. for the Durham Diocesan Board of Finance, Durham City. Architects: P. R. Middleton and Partner, 111 Albert-rd., Middlesbrough. (A) Marsh (Builders) Ltd., Grangefield-rd., Stockton-on-Tees, £150,000.

SUNDERLAND.—Erection of shops on the site of Regent Cinema, Ryhope-rd., for Ceres Investments Ltd. Architects: S. John Hill and Partners, 2 Whitfield-st., Gloucester. (A) Brixabur Builders Ltd., 21 Clarence-st., Gloucester.

SWINTON & PENDLEBURY.—Erection of 38 old peoples' flatlets, warden's accommodation and communal rooms at Clifton for BC. (A) G. & J. Seddon Ltd., Little Hulton, Walkden, £45,930.

WELWYN.—New premises at Black Fan-rd. for ICI Ltd. (A) Welwyn Builders Ltd., Welwyn Garden City, £250,000 (approx.).

WEST RIDING OF YORKSHIRE.—Erection of Keighley boys' grammar sch. for West Riding CC. Architects: Scherrer and Hicks of Manchester. (A) F. Shepherd & Son Ltd., Bradford, £400,000.

WIGAN.—Erection of 19 houses at Marsh Green for BC. (A) Direct labour, £27,532.

WINCHESTER.—Erection of 156 dwellings, etc., at Winnall Manor estate for City C. Architects: Wates Architectural Dept. Wates Ltd., £295,848.

WOOLWICH. — Foundations and r.c. frames for three 11-storey point blocks of flats at Glyndon redevelopment area for MBC. Architects: MBC. Design consultants: Norman & Dawbarn. (A) Modular Concrete Co. Ltd., £118,400.

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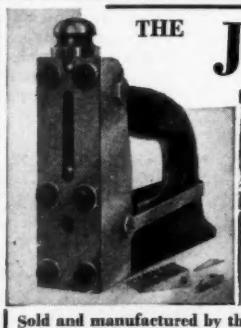

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